THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

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WATER-GAS.—APPLETON & GRAHAM,

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IS FAR SUPERIOR TO ANY OTHER machine in use, as it needs no fire or attention whatever, being entirely self-generating, and takes up but little space, three feet square being all that is required; and as it costs only $100 for ten burners, no family should be without one.

For Towns, Villages, Factories, Steamboats, or any place where steam can be easily had, we have an apparatus which will produce any quantity of rich illuminating gas, by merely decomposing the steam, and passing it through Coal Tar, or any other liquid Hydro-Carbon, the gas costing only 75 cents per 1,000 feet. It requires no purifier or gasometer, as it generates only sufficient gas for the burners lighted, the quantity being gauged by means of a self-acting regulator.

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GEORGE H. KITCHEN & CO., Manufacturers of Fixtures for Gas Light purposes, Wood's Building, No. 561 Broadway, New York. Office of the Inspector of Gas Meters for the State of New York.

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IRON-ROOF FRAMING,

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Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

GAS THERMOMETERS FOR ascertaining and regulating the temperature of the gas while passing through the purifiers into the station meters. For sale at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

HOT WATER GAS STOVES, Manufactured by HUNTER, KELLER & Co., 144 Centre street, New York.

See Engravings on page 168, Vol. II. of this JOURNAL.

MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

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SUFFOLK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

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RICHARD GLOVER begs to inform Gas Companies and Contractors that he has always on hand a large assortment of Thomas Glover's (of London) celebrated Dry Gas Meters.

Thomas Glover's Meters have now been in use in the United States and British Provinces, for the last Fourteen Years, and are extensively used by many Gas Companies, to their entire satisfaction; and R. Glover can with all confidence refer to them in proof that Thomas Glover's Meters are— the most Perfect in Principles— the most Correct in Registration—and more Durable than any other Dry Gas Meter made in the United States or Great Britain. R. Glover will at all times be glad to repair any Gas Meters sent him at the above factory. If any of them are of Thomas Glover's manufacture, and of a more recent date than Three years, he will make no charge.

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ALSO, BUNSEN'S PHOTOMETER, WITH COMPLETE APPARATUS FO WORKING THE SAME

* The standard of measurement of this Gas-Holder is given by Professors Torrey, of the U. S. Assay Office; Joy, of Columbia College; Gibbs, of the Free Academy, and several other distinguished scientific gentlemen.

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1500, 1502 and 1504 FILBERT St., PHILADELPHIA.

MANUFACTURERS OF

Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimental Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined, must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with despatch, and in all cases *guarantee entire satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing it superior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.

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MANUFACTURERS OF WET AND DRY GAS-METERS,

Station-Meters, Proving-Machines, Show-Meters, Test-Meters, Pressure Indicators, &c.

All of our Work is Guaranteed to be of the First Quality, as well as the material, and for this we can refer to numerous Gas-Light Companies.

JOSEPH LENNIG & CO.,

Nos. 313 & 315 NEW MARKET St., above Vine St., Philadelphia, Pa.,

MANUFACTURERS OF

Wet and Dry Patent Gas-Meters, Station, Show, Customer, and Experimental Meters, Photometers; Pressure-Registers, Indicators, and Gauges; Governors, Meter-Provers, Centre-Seals, Fluid Gauges, &c.

The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. Lennig & Co. confine their sole attention to the business of Gas-Meter making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us.

☞ **Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired.** ☜

METERS REPAIRED AND FORWARDED WITH DISPATCH.

WHERE GAS-WORKS AND WATER-WORKS ARE WANTED.

We are now publishing regularly the names of the thirty thousand post-towns in the United States, so that builders of gas-works and water-works, and the various manufacturers, may see where are new openings for business. And as each post-master will receive several copies of the AMERICAN GAS-LIGHT JOURNAL, for distribution, the number thus circulated will probably exceed *Three Million Copies. What a chance for advertisers!*

POST-OFFICE TOWNS IN THE UNITED STATES,

ARRANGED BY STATES AND COUNTIES,

Showing where Gas-Works and Water-Works are Wanted.

NEW YORK.

60 Counties, 2,530 Towns, 78 Gas-Works, 16 Water-Works.

(*Continued from page* 179.)

Jefferson County—Continued.

Sacket's Harbor, Saint Lawrence, Sanford's Corners, Smithville, South Champion, South Rutland, Sterlingville, Stone Mills, Stowell's Corners, Theresa, Three Mile Bay, Wardwell, *Watertown*, (c. h.) Wilna, Woodville, Worthville.

Kings County.

Bay Ridge, *Brooklyn*, (c. h.) Canarsie, Cresco, East New York, *Flatbush*, (c. h.) Flatlands, Fort Hamilton, Gravesend, Green Point, New Utrecht, Williamsburgh.

Lewis County.

Barnes' Corners, Brantingham, Collinsville, Constableville, Copenhagen, Croghan, Cronk's Corners, Deer River, Denmark, Diana, Diana Centre, Glensdale, Greig, Harrisburgh, Harrisville, High Market, Houseville, Indian River, Leyden, Lowville, Lyonsdale, Lyons' Falls, *Martinsburgh*, (c.h.) Montague, Naumburgh, New Boston, New Bremen, Osceola, Pinkney, Port Leyden, South Harrisburgh, Sterling Bush, Turin, Watson, West Leyden, West Lowville, West Martinsburgh, Wrightvale.

Livingston County.

Avon, Brooks' Grove, Byersville, Caledonia, Conesus, Conesus Centre, Cuylerville, Dansville, East Avon, East Groveland, East Hill, East Springwater, *Geneseo*, (c. h.) Gibsonville, Greigsville, Groveland, Groveland Centre, Hemlock Lake, Hunt's Hollow, Inverness, Kysonville, Lakeville, Lima, Livonia, Livonia Station, Moscow, Mount Morris, North Sparta, Nunda, Nunda Station, Oakland, Ossian, Piffard, Ridge, Scottsburgh, South Avon, South Lima, South Livonia, Sparta, Spring Water. Tuscarora, Union Corners, West View, York.

Madison County.

Bennet's Corners, Bouckville, Bridgeport, Brookfield, Canastota, Cazenovia, Chittenango, Chittenango Falls, Clockville, Cowaselon, De Lancey, De Ruyter, Earlville, East Hamilton, Eaton, Erieville, Fenner, Georgetown, Hamilton, Hubbardsville, Lakeport, Lebanon, Lenox, Leonardsville, Madison, *Morrisville*, (c. h.) Munsville, Nelson, New Woodstock, North Brookfield, Oneida, Oneida Lake, Oneida Valley, Perryville, Peterboro', Pine Woods, Poolville, Pratt's Hollow, Shed's Corners, Siloam, Solsville, South Brookfield, South Hamilton, Stockbridge, Sullivan, Wampsville, West Eaton.

Monroe County.

Adams' Basin, Brighton, Brockport, Bushnel's Basin, Charlotte, Chili, Churchville, Clarkson, Clarkson Centre, Clifton, East Clarkson, Egypt, Fairport, Gates, Greece, Hanford's Landing, Henrietta, Honeoye Falls, Irondequoit, Mendon, Mendon Centre, Mumford, North Chili, North Clarkson, North Creece, North Parma, North Rush, Ogden, Parma, Parma Centre, Penfield, Pittsford, Redman's Centre, Riga, *Rochester*, (c. h.) Rush, Scottsvile, South Greece, Spencerport, Sweden, Webster, West Brighton, West Greece, West Henrietta, West Rush, West Webster.

Montgomery County.

Ames, Amsterdam, Auriesville, Buel, Burtonsville, Canajohaire, Charleston, Charleston 4 Corners, Cranesville, Flat Creek, *Fonda*, (c. h.) Fort Hunter, Fort Plain, Frey's Bush, Fultonville, Glenn, Hagama's Mills, Hallsville, Minaville, Minden, Mindenville, Palatine, Palatine Bridge, Port Jackson, Root, Saint Johnsville, Scotch Bush, Spraker's Basin, Sprout Brook, Stone Arabia, Tribes Hill.

New York County.

Haerlem, King's Bridge, Manhattanville, New York, Washington Heights, Yorkville.

Niagara County.

Beech Ridge, Bergholtz, Cambria, Coomer, County Line, Dickersonville, East Porter, East Royalton, East Wilson, Gasport, Hartland, Hess Road, Hickory Corners, Johnson's Creek, Lake Road, La Salle, Lewiston, *Lockport*, (c. h.) Locust Tree, Mapleton, Martinsville, Middleport, Newfane, Niagara Falls, North Hartland, North Ridge, North Wilson, Olcott, Orange Port, Pekin, Pendleton, Pendleton Centre, Ransomville, Rapids, Reynale's Basin, Royalton, Shawnee, Somerset, South Pekin, South Royalton, South Wilson, Suspension Bridge, Walmore, West Somerset, Wilson's, Wright's Corners, Youngstown.

Oneida County.

Alder Creek, Augusta, Ava, Babcock Hill, Big Brook, Blossvale, Booneville, Bridgewater, Camden, Cassville, Clark's Mills, Clayville, Clinton, Deansville, Deerfield, Delta, Durhamville, East Florence, Florence, Floyd, Forest Port, Glenmore, Hawkinsville, Hecla Works, Higginsville, Hillsboro', Hill Side, Holland Patent, Hurlbutville, Kirkland, Knox Corners, Lairdsville, Lee, Lee Centre, Lowell, McConnellsville, Marcy, Marshall, New Hartford, New London, New White Lake, New York Mills, North Bay, North Bridgewater, North Gage, North Western, Oneida Castle, Oriskany, Oriskany Falls, Paris, Prospect, Remsen, *Rome*, (c. h.) Sangerfield, Sauquoit, Sconondoa, South Trenton, Stanwix, State Bridge, Steuben, Stittville, Stokes, Taberg, Trenton, Trenton Falls, Utica, Vernon, Vernon Centre, Verona, Vienna, Walesville, Washington Mills, Waterville, West Branch, West Camden, Westernville, Westmoreland, West Vienna, *Whitestown*, (c. h.)

Onondaga County.

Amber, Apulia, Baldwinsville, Belle Isle, Borodino, Brewerton, Camillus, Canal, Cardiff, Cicero, Clay, Collamer, Delphi, De Witt, Elbridge, Euclid, Fabius, Fair Mount, Fayettsville, Geddes, Hart Lot, Howlet Hill, Jack's Reef, Jamesville, Jordan, Kirkvale, La Fayette, Lamson's, Linn, Liverpool, Lysander, Mandana, Manlius, Manlius Centre, Manlius Station, Marcellus, Marcellus Falls, Marietta, Messina Springs, Mottville, Navarino, North Manlius, Onondaga Valley, Onondaga Castle, Onondaga, Oran, Otisco, Plainville, Plank Road, Polkville, Pompey, Pompey Centre, Salina, Skaneatles, South Onondaga, Spafford, Spafford Hollow, *Syracuse*, (c. h.) Thorn Hill, Three River Point, Tully, Tully Valley, Van Buren, Van Buren Centre, Vesper, Watervale, West Onondaga.

Ontario County.

Academy, Allen's Hill, Bristol, Bristol Centre, Canadice, *Canandaigua*, (c.h.) Chapinville, Cheshire, Clifton Springs, East Bloomfield, East Farmington, Farmington, Fishers, Flint Creek, Geneva, Gorham, Gypsum, Hall's Corners, Honeoye, Hopewell, Hopewell Centre, Manchester, Manchester Centre, Naples, North Bloomfield, Norton's Mills, Oaks' Corners, Orleans, Phelps, Port Gibson, Reed's Corners, Richmond Mills, Seneca Castle, Shortsville, South Bristol, Stanley Corners, Taylorsville, Victor, West Bloomfield, West Farmington.

Orange County.

Amity, Bellvale, Blooming Grove, Bullville, Buttermilk Falls, Centre Point, Chester, Circleville, Collaburgh, Coldenham, Cornwall, Craigsville, Cuddebackville, Edenville, Florida, Fort Montgomery, *Goshen*, (c. h.) Greenwood Works, Highland Mills, Howell's Depot, Huguenot, Little Britain, Middle Hope, Middletown, Minisink, Monroe, Monroe Works, Montgomery, Moodna, Mortonville, Mount Hope, *Newburgh*, (c. h.) New Hampton, New Milford, Otisville, Otterville, Oxford Depot, Pine Bush, Port Jervis, Ridgebury, Saint Andrews, Salisbury Mills, Savill, Scotchtown, Searsville, Slate Hill, Sparrow Bush, Sugar Loaf, Turner's, Unionville, Walden, Warwick, Waterloo Mills, Wells' Corner, West Point, West Town.

Orleans County.

Albion, (c. h.) Barre Centre, Carlton, Clarendon, Eagle Harbor, East Carlton, East Gaines, East Shelby, Gaines, Hindsburgh, Holley, Hulburton, Jeddo, Kendall, Kendall Mills, Knowlesville, Lyndonville, Medina, Milvillle, Murray, North Ridgeway, Oak Orchard, Ridgeway, Shelby, Shelby Basin, South Barre, Waterport, West Barre, West Carlton, West Gaines, West Kendall, West Shelby, Yates,

Oswego County.

Amboy Centre, Bernhard's Bay, Bowen's Corners, Boylston, Butterfly, Cartersville, Caughdenoy, Central Square, Cleaveland, Colosse, Constantia, Constantia Centre, Dugway, Fair Dale, Fulton, Gilbert's Mills, Granby Centre, Greensboro', Hannibal, Hannibal Centre, Hastings, Hastings Centre, Hinmansville, Kasoag, Kinney's Four Corners, Mexico, Minetto, Molino, New Centerville, New Haven, North Scriba, North Volney, Orwell, *Oswego*, (c. h.,) Oswego Falls, Palermo, Parish, Pennellville, Phœnix, Port Ontario, Pulaski, Redfield, Salmon River, Sand Bank, Sandy Creek, Scriba, Seneca Hill, South Albion, South Granby, South Hannibal, South Richland, South West Oswego, Texas, Union Settlement, Union Square, Vermillion, Volney, West Amboy, West Monroe, Williamstown.

Otsego County.

Burlington, Burlington Flats, Butternuts, Centre Brook, Chaseville, Cherry Valley, Colliersville, *Cooperstown*, (c. h.,) Decatur, East Springfield, East Worcester, Edmeston, Exeter, Fly Creek, Garratsville, Hartwick, Hartwick Seminary, Laurens, Maple Grove, Maryland, May Flower, Middlefield, Middlefield Centre, Milford, Morris, Mount Vision, New Lisbon, Oaksville, Oneonta, Oneonta Plains, Otego, Otsego Lake, Otsdawa, Pittsfield, Pleasant Brook, Portlandville, Richfield, Richfield Springs, Roseboom, Salt Springville, Schenevus, Schuyler's Lake, South Edmeston, South Hartwick, South Valley, South Worcester, Spooner's Corners, Springfield, Springfield Centre, Toddsville, Unadilla, Unadilla Centre, Unadilla Forks, West Burlington, West Edmeston, West Exeter, Westford, West Laurnes, West Oneonta, Westville, Worcester.

Putnam County.

Brewster's Station, *Carmel*, (c. h.,) Cold Spring, Dykeman's, Farmer's Mills, Garrison's, Haviland Hollow, Kent, Ludingtonville, Mahopac, Milltown, Patterson, Red Mills, Towner's.

Queens County.

Astoria, Cedar Swamp, College Point, East Norwich, Farmingdale, Flushing, Freeport, Glen Cove, Hempstead, Hicksville, Jamaica, Jericho, Jerusalem South, Jerusalem Station, Locust Valley, Little Neck, Manhasset, Maspeth, Merrick, Mineola, Newtown, *North Hempstead*(ch) Oyster Bay, Queens, Ravenswood, Rockaway, Rockaway Beach, Rockville Centre, Roslyn, South Oyster Bay Syossett, Whitestone, Woodbury.

Rensselaer County.

Alps, Berlin, Brainard, Castleton, Centre Berlin, Centre Brunswick, Cropseyville, Defriestville, Eagle Bridge, Eagle Mill, East Grafton, East Greenbush, East Nassau, East Poestenkill, East Schodack, Grafton, Greenbush, Haynerville, Hoag's Corner, Hoosick, Hoosick Falls, Johnsonville, Junction, Lansingburgh, Nassau, North Hoosick, North Nassau, North Stephentown, Petersburgh, Petersburgh Four Corners, Pittstown, Poestenkill, Potter Kill, Quacken Hill, Raymertown, Sand Lake, Schaghticoke, Schodack Centre, Schodack Depot, Schodack Landing, South Berlin, South Sand Lake, South Schodack, South Stephentown, Stephentown, Tomhannock, *Troy*, (c. h.,) Valley Falls, West Berlin, West Hoosick, West Sandlake, West Stephentown, Wynantskill.

Richmond County.

Bay View, Bentley, Kreischerville, Lemon Creek, Long Neck, Marshland, New Brighton, New Springville, North Shore, Port Richmond, *Richmond*, (c. h.,) Richmond Valley, Rossville, South Side, Stapleton, Tompkinsville.

Rockland County.

Blauveltville, *Clarkstown*, (c. h.,) Haverstraw, Monsey, Nanuet, North Haverstraw, Nyack, Nyack Turnpike, Palisades, Piermont, Ramapo Works, Rockland Lake, Sloatsburgh, Spring Valley, Suffern, Tappantown.

Saratoga County.

Bacon Hill, *Ballston*, (c. h.,) Ballston Centre, Barkersville, Batchellerville, Bemus' Heights, Burnt Hills, Charlton, Clifton Park, Corinth, Coveville, Crescent, Day, Dean's Corners, Dry Dock, East Galway, East Line, Edinburgh, Fortsville, Galway, Gansevoort, Grangerville, Greenfield Centre, Groom's Corners, Hadley, Half Moon, Jonesville, Ketcham's Corners, Malta, Maltaville, Mechanicsville, Middle Grove, Moreau Station, Mosherville, Mount Pleasant, North Galway, North Greenfield, Northumberland, Porter's Corners, Providence, Quaker Springs, Rexford Flats, Rock City Mills, Saratoga Springs, Schuylersville, South Ballston, South Corinth, South Galway, South Glenn's Falls, Stillwater, Victory Mills, Vischer's Ferry, Waterford, West Charlton, West Day, West Greenfield, West Hadley, West Mileon, West Providence, Whiteside's Corners, Wilton.

Schenectady County.

Braman's Corners, Duanesburgh, East Glenville, Glenville, Hoffman's Ferry, Mariaville, Quaker Street, *Schenectady*, (c. h.,) Scotia.

(*To be concluded.*)

CARBURATION OF GAS IN LONDON.—Dr. Letheby has presented a report to the City Commission of Sewers of London, recommending the extra carburation of gas supplied to the city lamps. From the data obtained it is considered that the process of carburation will economize the consumption to the extent of from 40 to 50 per cent., assuming that the best quality of naphtha be used, namely, a naphtha which should give to the gas continuously a proportion of about ten grains of volatile hydrocarbon to each cubic foot of gas; for it has been found by experiment that a naphtha yielding but four grains would increase the illuminating power of the gas to only about 15 or 20 per cent.

GAS IN SCOTLAND.—To all appearance, the project of a new Gas Company in Perth, Scotland, is about to be abandoned. At a recent meeting of the Committee of the Consumers' Company, held in the Guild Hall, a proposition from the second, or Perth New Gas-Light Company, was taken into consideration. This proposition was to the effect that the new company would supply gas for the space of seven years at 4s. 4½d. per 1,000 cubic feet, upon a guaranteed consumption of 20 millions of cubic feet; or at 5s. upon a guaranteed consumption of 15 millions. The meeting agreed to recommend this offer to a general meeting of their shareholders to be called on an early day.

WATER-WORKS OF AMERICA.

DANBURY, CONN.

ANNUAL REPORT OF THE WATER COMMISSIONERS.

To the Warden, Burgesses, and Freemen of the Borough of Danbury:

The Board of Water Commissioners herewith respectfully submit their first annual report.

The act authorizing the construction of our Water Works was accepted at a Borough meeting held on the 17th May, 1861, by a vote of 240 yeas to 30 nays, and at the same meeting the present Board elected, who promptly made contracts in behalf of the Borough for the construction of the entire work. On the 22d May, a contract was made with the Patent Water and Gas-Pipe Co., of Jersey City, to furnish and lay down ready for use, and keep in repair for two years, all the pipes, gates, and hydrants required. On the 2d of June a contract was made with G. & R. Redfield, to construct the dam and wasteway, and on the 4th of June a contract was made with William E. Hunt to do all the trenching and back filling. The latter contractor after completing about half his contract abandoned it, and your Board employed the Jersey City company to do the remainder of his work.

The right of way and land damage was all appraised by a committee appointed by the Superior Court. One of the proprietors, soon after the award of the committee, instituted legal proceedings against the Borough and obtained a writ of injunction, causing some delay and legal expense, but we are glad to report that the suit has since been amicably settled by withdrawal on the part of the plaintiff.

Ground was first broken for the work on the 18th June, and it was vigorously prosecuted with few interruptions till the middle of December, at which time the water was let on to all parts of the Borough, except a small portion east of Barn Plain Bridge. Owing to the high state of water is the river, it was found impracticable to make this connection until the present season, but it is now completed by the insertion of 80 feet of cast-iron six-inch pipe, in the bed of the stream.

There has been laid in all 48,220 feet of pipe, as follows: 128 feet of 12-inch, 6,837 feet of 10-inch, 5,013 feet of 8-inch, 17,862 feet of 6-inch, 15,486 feet of 4-inch, and 2,894 feet of 3-inch. Sixty-five hydrants, located by the Warden and Burgesses have been set, and twenty-five stop and waste gates, from the 3 to 12 inches in diameter. The reservoir, holding 40,000,000 gallons at an elevation of 200 feet above Main street, has been substantially constructed, and the experience of the past summer has been very favorable in regard to the abundance and permanence of the supply of water. The pipe used has been the cement and sheet-iron pipe, which we consider superior in all respects to cast-iron, besides being much less expensive. Some imperfections existed on the first completion of the work, as would have been the case if any other kind of pipe had been used, but we hope and believe that the weak places have all shown themselves, and been repaired, and that we now have a line of pipe which will not corrode or fill up with rust and tubercles like iron pipe, but increase in strength and solidity as it increases in age, and furnish for all time to come a pure and a perfect conductor for our water. We would take this opportunity to say that we have uniformly found the Patent Water and Gas Pipe Co., our contractors, prompt and honorable in all their dealings.

Your Board, in view of the importance and permanent character of the work, the present and probable future necessities of our Borough, and encouraged by the unanimity of feeling among our citizens, have carried it out on a somewhat more extensive plan than at first contemplated. Instead of 6 miles of pipe, as first proposed, they have laid more than 9 miles. Instead of an 8-inch main supply pipe, they have put in a 10-inch, which though involving a considerable additional expense, yet being in capacity more than 50 per cent. larger, gives a much more effective head for fire purposes and for the further extension of the works. With these and other additional expenditures, and including the interest on our bonded debt up to July 1st, 1861, which we think should properly be charged to construction account, the total cost of the entire work will not exceed $37,500. In comparison with the cost of similar words of equal magnitude in other parts of our country, this will be found 25 to 50 per cent. less than any heretofore constructed. As the borough have authorized the issue of only $30,000 of bonds, it will be necessary to provide means for the payment of the remaining $7,500, either by a further issue of bonds, or in such other way as may be deemed expedient.

Our bonds, bearing 6 per cent. interest, have been sold at par and accrued interest, as required by our charter.

Our revenue, owing to the general prostration of all kinds of business, has not been as large as we had reason to anticipate. Many families who desire to use the water, are at present unable to incur the necessary expense of its introduction. Our manufacturers, having had but little business, have furnished but little revenue. We have also made a deduction on most of the bills, owing to the bad state of the water during a portion of the summer. Our books show that at present the water is taken by 91 families, 7 hat factories, 11 stores and shops, 1 gas company, 1 dye house, 1 jail, 1 livery stable, 3 churches, &c. The amount of net revenue up to Dec. 1, 1861, will be about $700.

We have fixed low rates for the use of the water, and we trust all our citizens will feel an interest in its introduction into every house in the Borough. We feel assured that no investment can be made yielding such sure daily returns in comfort and convenience, besides contributing to the payment of the interest on our bonds, which if not met by revenue must be raised by taxation.

During a few weeks of the past summer our water was unpleasantly affected in smell, taste, and color, by the decomposition of the grass and other vegetable matter in the bottom of the reservoir. As this has given rise to many inquiries and some apprehensions, we take this opportunity to make the following extract from a report made by Professor Silliman, of Yale College, on the subject, to the Water Commissioners of New Britain, where a similar difficulty was experienced the first season to a much greater extent than with us. He says:

"All experience in similar cases would have led us to expect and foretell just such a train of phenomena as has actually followed the filling of your artificial lake upon such a bottom. There was a large aggregate amount of decomposing vegetable matter, stumps and roots of trees, bushes, grass, &c., all suddenly deprived of life when in full vigor, and compelled to undergo decomposition not under natural causes, exposed to air, but flooded with water. Under these circumstances the water receives from the green wood and other vegetables, a large amount of sap, and extractive matter, drawn from the pores and cellular tissues of the plants. This matter passes directly into solution in the water, and by a process a kin tofermentation gives to it more or less the coffee color, so commonly seen in the waters of swamps. As the cause of these disturbances is limited to the quantity of green vegetable matter originally flooded, it follows that the sources of this disturbance is limited in fact to the extractive matter the water withdraws in the form of sap and other products. The annoyance was therefore much more considerable in the first summer than it will prove in the second, and it will steadily diminish, until after three or four years it will entirely cease to attract attention."

The reservoir at New Britain, in regard to which this report was made, is in extent over 100 acres, a considerable part of which was originally soft marshy bottom. Ours being in area only 10 acres, with mostly hard bottom, we have reason to believe that the duration of the inconvenience, in our case will be much less than the time above fixed by Prof. Silliman.

In regard to the efficiency of the works for fire and other purposes, we believe all our citizens are fully satisfied. Streams from five fire hydrants have been played simultaneously, attaining a height of upwards of 100 feet. Our hydrants being so located that very nearly every building within the present limits of our Borough can be reached in case of fire, rates of insurance have been materially diminished. No difficulty is experienced in supplying steam-boilers direct from our mains, without the intervention of pumps. For drinking, washing, culinary, and other domestic purposes, the water is very soft and pure, and has given good satisfaction whenever introduced, except during the brief period of vegetable decompositon during June and July.

Your Board, in concluding this report, would be wanting in common courtesy if they omitted to acknowledge the cordial coöperation of all our citizens, and their kind assistance whenever required in the oftimes perplexing duties connected with the construction of the work.

Appended hereto will be found a financial statement as required by the provisions of our charter.

All of which is respectfully submitted.

JOHN W. BACON,
CHARLES HULL,
HENRY BENEDICT,
} Water Commissioners.

Danbury, Nov. 5, 1861.

STATEMENT OF RECEIPTS AND DISBURSEMENTS UP TO NOVEMBER 5TH, 1861.

Received for Bonds No. 1 to 59 inclusive, $500 each	$29,500 00
Received for accrued interest and interest on deposit	417 01
	29,917 01
Revenue (collected by T. Mootry) to this date	531 47
Total receipts	30,448 48
Paid Patent Water and Gas Pipe Co. on their contract	22,892 33
Paid G. & R. Redfield on their contract for dam	1,663 00
Paid William E. Hunt on contract for trenching	1,252 57
Paid for land damages and right of way	1,300 00
Paid for water meters and freights on same	762 70
Paid interest on bonds due January 1st, 1861	600 00
Paid interest on bonds due July 1st, 1861	840 00
Paid expenses of appraisers and witnesses	67 62
Paid Roger Averill bill legal services and expenses	77 15
Paid Nelson L. White bill legal services and expenses	69 80
Paid for building stone wall around reservoir	212 00
Paid for extra work on dam	142 18
Paid for drills to tap pipe	20 00
Paid for hose and fixtures for watering streets	50 50
Paid for stationery, printing, and advertising	56 75
Paid for sundry small bills, for help surveying work on filter, repairing streets, expenses sundry times to New Milford and Bridgeport, horse hire, iron pipe, &c., &c.	49 24
	30,055 84
Paid for labor, watering streets, repairing hose cart, &c.	102 60
Total disbursements	$30,158 44

There is still due the Jersey City company on their contract about $7,250, which is payable on the 1st January next.

I certify that the above accounts are correct.

JOHN W. BACON, Water Commissioner.

Sworn to before me this 5th November, 1861.

W. JABINE, Notary Public.

DANGEROUS CHARACTER OF BENZINE.—A recent review of fires in this city since the 24th October, by the Fire Marshal, Mr. A. W. Blackburn, refers to benzine in connection with two or three disastrous fires originating through its use. The Fire Marshal has been convinced that haversacks and knapsacks, made of duck or muslin, or any kind of linen or cotton fabric, when coated with paint, composed of lampblack and linseed oil, hastily and carelessly mixed, and then glazed with varnish, in which benzine is an ingredient, when packed tightly in boxes for transportation, or closely piled in heaps in manufactories, are constantly liable to take fire from spontaneous combustion. Benzine is a component part of petroleum or coal-oil in its crude state, as it comes from the earth. In refining coal-oil for burning or lighting purposes, the benzine, which is highly explosive, is got rid of by the process of distillation. From being, as it was first considered, a refuse substance, it is now fast becoming an important article of trade. In various manufacturing and mechanical arts, it has been found an admirable substitute for turpentine, and owing to the scarcity and high price of the latter article, since the blockade of the North Carolina ports, benzine from its comparative cheapness—and, indeed, from the almost absolute necessity of the case—is fast taking its place. It makes a handsome and durable paint, and on wood and other solid surfaces, is harmless; but as an ingredient in the coating on vegetable textile material, it is, at all times, more or less dangerous. It is very volatile, and at a certain temperature rapidly assumes a gaseous form. Where articles, such as knapsacks, haversacks, &c., freshly glazed with varnish made with it, are undergoing the process of drying, especially by the heat of boilers or steam-pipes, the whole surrounding atmosphere becomes filled with benzine gas, and let combustion ensue from any cause whatever, at such a time, the apartment will be enveloped in flames, with the rapidity of lightning. These facts are well worth the attentive consideration of Underwriters.—*Tuckett's Phila. Insurance Journal.*

IMPORTANT ACTION OF INSURANCE COMPANIES.

PETROLEUM DECLARED EXPLOSIVE AND UNINSURABLE IN ORDINARY BUILDINGS.

The Board of Fire Insurance Companies, at a meeting held on the 12th ultimo, appointed a special committee of five to investigate and report upon the nature of petroleum or rock-oil, earth oils, Benzine, Benzole, and Naphtha, and the oils refined from petroleum and coal oil, with a rate of insurance upon these articles. The committee, consisting of Messrs. D. A. Heald, of the Home Insurance Company; George T. Hope, Continental Insurance Company; E. A. Stansbury, Metropolitan Insurance Company; Henry A. Oakley, Howard Insurance Company; J. L. Douglass, Merchants' Insurance Company, made their report a few days since. The report states that petroleum, rock oil, or earth oil, as it is generally received in its crude and unrefined state, is largely charged with volatile matter, highly inflammable in its nature, and evolved to some extent at the usual temperature of the atmosphere, and much more freely by an increased degree of heat, and it adds:

"This gas, when evolved in large quantitites, and mingled with the air in closed buildings, becomes exceedingly inflammable, and, under certain contingencies, like coal gas, highly explosive. The oil itself, when in actual contact with fire, burns with a very dense smoke and intense heat, and is nearly or quite inextinguishable by water. Excited by a high degree of heat, it becomes more inflammable, penetrates surrounding objects, and imparts to them its own destructive qualities. The storage of these oils is not only dangerous on account of their liability to fire, and their destructive properties when on fire, but on account of their injurious effects on other merchandise stored in the same or even adjoining buildings, by reason of their offensive and penetrating odor. In a fire of any considerable magnitude, this explosive gas would be generated in immense quantities, and the destruction of property in a compact portion of the city would, in all probability, be incalculably great."

The following resolutions, appended to the report, were adopted by the Board:

Resolved, That petroleum, rock oil, and earth oil, in a crude or unrefined state, be and hereby are declared uninsurable, except when stored in detached and properly ventilated sheds and warehouses, specially adapted by their construction for that purpose, and devoted exclusively to the storage of such oils, or substances of a similar character, and then, at *a special rate of not less than three per cent.*

Resolved, That benzine, benzole, and naphtha, when kept in quantities of three barrels or less, be classed as "specially hazardous," and charged as such; and when kept in larger quantities than three barrels, be subject to the same restrictions and rates as crude petroleum, rock oil, and earth oil.

Resolved, That manufactured coal oil, refined petroleum oil, kerosene and carbon oil, and all oils manufactured from coal, rock, or earth oil, and petroleum, when kept in less quantities than ten barrels, be classed as "extra hazardous;" and when kept in larger quantities than ten barrels, be classed as "specially hazardous," and charged as such.

PETROLEUM, OR COAL OILS.

CHEMICAL WORKS OF THE PENNSYLVANIA SALT MANUFACTURING COMPANY, EAST TARENTUM, ALLEGHENY COUNTY, PA.
November 28, 1861.

Dear Sir,—Your favor of the 25th instant, with inquiries regarding the inflammability of crude and refined petroleum, or coal oils, duly came to hand. A short description of the peculiarities of these substances will probably meet your wishes.

The term "coal oil" is applied indiscriminately in the *Atlantic* States, at least, to the fluids obtained by the destructive distillation of Cannel coals, and, also, to those made from the *native* "petroleum," or "carbon oil," as it sometimes is termed, produced by the oil wells of western Pennsylvania, Virginia, and other localities.

All of these oils consist of compounds of hydrogen and carbon (the so-called hydro-carbons), together with various amounts of foreign matters or impurities, and now requiring notice. These hydro-carbons, constituting the valuable portions of the oil, possess different properties, and are more or less inflammable, in proportion to the amount of hydrogen combined with the carbon, their boiling point and specific gravity being also affected thereby. The oils, whether crude or refined, consist of variable mixtures of those bodies, and have the following characteristics. Crude "coal" oil, is made from coal itself, and is a thick black liquid, like tar, having a specific gravity varying from 16 degrees to 30 degrees, Beaumé (Sp. Gr. 959 to 875). It is sometimes, however, partly purified by rectification, though still called "crude" oil, and has a density as low as 38 deg. B. (Sp. Gr. 833.) It consists, in the crude state, of a mixture of liquids, boiling, some about 300 deg. F., and, of others, boiling not under 700 deg. F. Whatever may be its density within these limits, it gives off no inflammable vapors from its surface; a lighted match will be extinguished if dipped into it, even if heated in a dish so hot as to scarcely be held by the naked hand, and may be considered as safe from risk of explosion or ignition as common tar would be in like circumstances. Although an article of commerce heretofore, and of shipment from the western states to the eastern ones, it has never been, I believe, nor is it likely to become, an article of foreign export or import. Owing to the present low price of petroleum, it is not now met with in commerce.

Crude "petroleum" is a dark greenish, almost black liquid, of density from 30 to 52 deg. B; (Sp. Gr. 875 and 769,) odor very strong and disagreeable, and varying in inflammability from a condition very little more dangerous than that of coal oil to that of one of the most inflammable fluids known. The heavier varieties were, until within the last twelve months, the most frequently met with, but since the discovery of the so-called "blowing wells," the lighter grades of oil can only be met with, seldom if ever now found under 40 deg. B., averaging probably from 43 to 45 degrees Beaumé.

Petroleum of this character, when exposed in an open vessel, emits so much vapor in common temperatures from its surface, as readily to ignite on the application of a lighted match, and if in large quantity, can be set on fire by the flame, when held some distance above the surface. If the vapor becomes mixed with air in suitable proportions, in a confined space, the contact of a flame will ignite the mixture, and cause a terrific explosion. When stored in large quantities, however, if ordinary means of ventilation are furnished, the crude oil, when in barrels, seems capable of being stored with less risk than the above character of the oil would seem to indicate.

Thus, hundreds of thousands of barrels of petroleum have been brought down from the oil regions of Pennsylvania in flat boats and steamboats: in the latter case loaded in the hold of the vessel, and in almost immediate proximity to the boiler fires; lamps, etc., being used without apparent care. Notwithstanding this, no accident has as yet occurred from fire or explosion on the river. The Pennsylvania Railroad Company had upwards of 3,000 barrels of petroleum stored in the cellar under their extensive "Duquesne Depot," in Pittsburgh, during the summer months. Many barrels were leaking, and the whole cellar in consequence in *puddles* with the oil. Gas lights were introduced into this cellar, and other freight brought in and taken out by gas-light without accident. Upwards of one thousand barrels of oil were in fact *gauged* in this manner by open gas-light, and probably no ill result would have occurred but for the abominable carelessness of some of the men employed, actually throwing a blazing match into the puddles of oil on the floor, when, of course, the whole building, 600 feet in length, was instantly in flames, and in twenty minutes destroyed from end to end. If care is taken on *ship*-board, to avoid the introduction of fire in any shape into the hold of the vessel—or into the *warehouse* containing the oil, *fire* or explosion *cannot* occur; but should such an accident happen, and a few gallons of oil become ignited, it is almost impossible to check or extinguish the flame until all is destroyed.

"Refined Oil," whether from coal or petroleum, is dependent for its safety entirely upon the care and conscience of the manufacturer, as before stated; the crude oils contain various hydrocarbons—practically distinguished from one another by their density, boiling points, and consequent greater or less inflammability. In the crude coal-oil, the amount of the very inflammable substances to *explode*, is but small, and consequently is not easily ignited. The process of refining, however, in separating a large amount of foreign matter, necessarily increases the proportion of inflammable oil, so that the careful refiner of coal-oil always rejects a portion of the yield, which, if left in would communicate too great inflammability to the whole. With *petroleum* the same facts exist, only in an almost infinitely greater degree. The crude article being, as above mentioned, so inflammable of itself, becomes by the process of refining, of course, still more so, and unless all the lighter and inflammable portions are removed, is far more dangerous than the crude.

As the portions requiring to be reserved from the crude oils now obtained is seldom much if any less than twenty-five per cent., and the demand existing for this light portion, under the name of "benzine," does not by any means equal the supply, it is evident that a great inducement exists to unscrupulous persons to leave as much of this inflammable substance in the oil as possible, by which means their product of oil and consequent profits are immediately increased, at the expense of the safety and possibly of the life of the purchaser. Manufacturers of standing and position, to whom permanent reputation and conscientious discharge of duty is more valuable than any temporary profit, whatever it may be, remove *all* of this light portion, boiling, for instance, at 280° F., or more. Their manufacture, in consequence, is free from all the objections applicable to the above.

Thus the "Natrona" oil contains *no* inflammable benzine; it cannot be ignited by the application of a lighted match to the surface, *extinguishing* it when dropped into the oil, and even when repeated a dozen times, or until the surface of the oil becomes so heated, by direct contact with the flame, as to cause ignition in almost any oleaginous fluid.

In other words, such an oil, so prepared, may be shipped in tight or leaking packages with no *danger whatever* of gaseous explosions, since no gas or vapor is given off from the oil to mix with the air, and with no greater risk of *any* kind than would apply to the shipment or storage of lard, sperm, or other oil. In fact, in one respect it is safer than the latter, since no danger of spontaneous ignition exists with *this* oil, whilst it is well known that many fires have occurred from the spontaneous combustion of rags or sawdust wet with animal or vegetable oils.

Should any further details be required, I will take pleasure in furnishing them.

Yours, truly,
H. PEMBERTON, Superintendent.

NATURAL OIL AND GAS IN CALIFORNIA.—The miners for natural coal-oil are very sanguine that they have their fortunes in store, in Lower Mattole Valley. Major McCoy has a natural spring, out of which he has dipped as many as 30 gallons in one week. Prospects upon Davis's ranch, where a well is being sunk on the principle of artesian wells, are also very flattering. There are also some other curious facts connected with this region of country which deserve notice. Near the Mattole river are a number of escapes, out of which is constantly issuing gas, which has the peculiar smell of the manufactured article which lights all of our principal towns and cities; and when a blaze is applied it it readily ignites, and will blaze up many feet in the air. One of these escapes is in the Mattole river, near the centre; and with a torch, any person who has the curiosity to try it, may do what few people have thought possible—set the river on fire. These escapes are not confined entirely to this particular neighborhood. There are a number of them on Bear river, some 15 miles north of Mattole, and above Cape Mendocino.

OUTBURST OF NATURAL GAS.—There is a profitable salt well now in operation at Wellesville, Ohio, which was sunk in the hope of finding oil. At the depth of four hundred and eighty feet, the borers struck a vein of gas which burst with such violence as to project the boring tools to a considerable distance, together with some two hundred feet of pipe which had been previously introduced.

TABLE OF GAS-LIGHT COMPANIES IN THE UNITED STATES.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

No.	Chartered.	Town.	State	Chart'd Capital.	Per Sh. $	Sem An'l Div.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Rosin, Coal, or Water	
1	1857	Adrain	Mich.	50,000	50	—	May & Nov.	4,000	3 50		
2	1856	Akron	O.	20,000	33½	—	Do.	3,500	3 00		
3	1845	Albany	N. Y.	250,000	20	4	Jan. & July.	65,000	3 00		
4	1858	Albion	N. Y.	30,000	100	—	Do.	3,000	3 80		
5	1851	Alexandria	Va.	106,530	—	—	City Works.	9,000	3 50		
6	1852	Alleghany	Pa.	200,000	25	4	May & Nov.	25,000	3 00		
7	1858	Allentown	Pa.	60,000	100	3½	Do.	5,000	3 50		
8	1857	Alton	Ill.	75,000	—	—	Private Works	4,000	3 50		
9	1859	Altoona	Pa.	40,000	20	4	Jan. & July.	5,000	3 00		
10	1859	Amesbury & Salisbury	Mass.	30,000	25	—	Do.	7,000	4 00		
11	1858	Annapolis	Md.	100,000	25	—	Jan. & July.	4,000	4 00		
12	1858	Ann Arbor	Mich.	23,000	50	5	Mar. & Sept.	5,500	4 00		
13	1858	Astoria	N. Y.	20,000	50	—	Do.	6,000	4 00		
14	1855	Atlanta	Ga.	50,000	25	5	Jan. & July.	12,000	5 00		
15	1857	Attleboro'	Mass.	6,000	50	3	Do.	2,000	6 00	Rosin.	
16	1850	Auburn	N. Y.	80,000	50	5	Do.	10,000	7 00	Rosin.	
17	1851	Augusta	Ga.	80,000	25	8	Do.	9,000	6 00	Wood	
18	1853	Augusta & Hallowell	Me.	84,700	50	5	Do.	10,000	4 00		
19	1860	Aurora	Ind.	10,000	—	—	Private Works	3,500	3 50	Water	
20	1817	Baltimore	Md.	550,000	100	5	June & Dec.	150,000	2 50		
21	1852	Bangor	Me.	120,000	100	4	Jan. & July.	12,000	3 50		
22	1855	Batavia	N. Y.	32,000	20	4	Do.	2,500	4 00		
23	1853	Bath	Me.	65,000	100	3	April & Oct.	10,000	3 75		
24	1859	Bath	N. Y.	15,000	50	—	May & Nov.	3,000	7 00	Rosin.	
25	1861	Battle Creek	Mich.	15,000	—	—					
26	1858	Belfast	Me.	14,000	100	—	Jan. & July.	7,000	7 00	Rosin.	
27	1856	Bellefont	Pa.	20,000	25	2	Do.	3,500	4 00		
28		Beloit	Wis.	30,000	—	—	Do.	4,000	4 00		
29	1854	Bethlehem	Pa.	50,000	50	4	June & Dec.	2,000	3 20		
30	1859	Beverly	Mass.	40,000	100	—	Jan. & July.	4,000	4 00		
31	1853	Binghampton	N. Y.	50,000	50	3½	Do.	10,000	4 00		
32	1859	Birmingham	Pa.	40,000	50	—	Do.	4,000	4 00		
33	1855	Bloomington	Ill.	40,000	50	—	Do.	6,000	4 00		
34	1853	Bordentown	N. J.	50,000	25	3	June & Dec.	4,000	3 80		
35	1822	Boston	Mass.	1,000,000	500	5	Do.	130,000	2 25		
36	1859	Brattleboro'	Vt.	21,000	—	—	Do.	3,000	4 00		
37	1851	Bridgeport	Ct.	90,000	25	4	Jan. & July.	10,000	4 00		
38	1857	Bridgeton	N. J.	50,000	20	—	Do.	5,000	4 00		
39	1856	Bristol	Pa.	30,000	25	3	Feb. & Aug.	3,000	4 00		
40	1855	Bristol	R. I.	35,000	50	2	Jan. & July.	6,000	4 00		
41	1859	Brockport	N. Y.	25,000	100	3	Do.	1,500	4 00		
42	1853	Brookline	Mass.	66,000	100	4	Feb. & Aug.	3,500	4 00		
43	1825	Brooklyn	N. Y.	2,000,000	25	5	Jan. & July.	150,000	1 50		
44	1848	Buffalo	N. Y.	600,000	50	5	Do.	70,000	3 00		
45	1852	Burlington	N. J.	100,000	25	3	Do.	5,000	4 00		
46	1853	Burlington	Vt.	75,000	25	2½	Do.	10,000	4 50		
47	1859	Burlington	Iowa.	65,000	50	—	Do.	8,000	4 00		
48	1861	Calais	Me.	90,000	100	—	Do.	10,000	3 50		
49	1852	Cambridge	Mass.	300,000	100	5	Feb. & Aug.	20,000	3 50		
50	1852	Camden	N. J.	300,000	100	3	April & Oct.	10,000	3 50		
51	1853	Canandaigua	N. Y.	50,000	50	—	Jan. & July.	3,000	4 00		
52	1856	Canton	O.	19,000	50	6	Mar. & Sept.	6,000	3 00		
53	1853	Cape Island	N. J.	80,000	100	3	October.	10,000	6 00		
54	1860	Carbondale	Pa.	16,000	25	—	Mar. & Sept.	5,000	4 00		
55	1855	Carlisle	Pa.	30,000	25	—	Jan. & July.	4,000	4 00		
56	1856	Catasauqua	Pa.	15,000	25	5	May & Nov.	2,000	4 00		
57	1858	Catskill	N. Y.	10,000	—	—	Private Works	3,000	4 00		
58	1857	Chambersburg	Pa.	30,000	25	—	Jan. & July.	3,000	4 00		
59	1846	Charleston	S. C.	723,800	25	4	Do.	50,000	4 00		
60	1851	Charlestown	Mass.	200,000	50	4	Do.	30,000	3 00		
61	1858	Charlotte	N. C.	14,000	50	10	Mar. & Sept.	3,500	6 00	Rosin.	
62	1859	Charlotteville	Vt.	15,000	25	—	Do.	4,000	4 50		
63	1851	Chelsea	Mass.	100,000	100	3½	Jan. & July.	8,000	3 50		
64	1856	Chester	Pa.	35,000	25	3	April & Oct.	4,000	4 00		
65	1849	Chicago	Ill.	1,300,000	25	5	Jan. & July.	100,000	2 50		
66	1857	Chicopee	Mass.	50,000	20	—	Do.		4 00		
67	1851	Chillicothe	O.	40,000	25	4	Do.	12,000	3 50		
68	1841	Cincinnati	O.	1,600,000	100	5	Do.	225,000	2 50		
69	1859	Citizens', Brooklyn	N. Y.	1,000,000	20	—	Do.	275,000	2 00		
70		Clarkesville	Tenn.	100,000	50	—	Do.	5,000	4 00		
71	1860	Claremont	N. H.	20,000	100	—	March & Sept.	3,000	4 00		
72	1846	Cleveland	O.	200,000	10	5	Jan. & July.	20,000	3 00		
73	1858	Clinton	Mass.	30,000	500	5	Do.	3,000	4 00		
74	1859	Clyde	N. Y.	10,000	50	4	Do.	2,500	4 00		
75	1854	Cohoes	N. Y.	50,000	20	3½	April & Oct.	5,000	3 60		
76	1860	Cold Spring	N. Y.	30,000	50	—	Do.	3,500	6 00	Rosin.	
77	1860	Cold Water	Mich.	25,000	50	5	Jan. & July.	4,000	4 00		
78	1852	Columbia	Pa.	37,500	25	—	Do.	4,000	3 50		
79	1852	Columbia	S. C.	44,000	25	4	Do.	6,000	6 00		
80	1857	Columbia	Cal.	50,000	25	—	Do.	4,500	10 00		
81	1853	Columbus	Ga.	54,000	25	5	Do.	5,000	7 00	Rosin.	
82	1850	Columbus	O.	100,000	10	6	Do.	30,000	3 00		
83	1853	Concord	N. H.	50,000	50	5	Do.	8,000	3 50		
84	1853	Covington & Newport	Ky.	100,000	50	3½	Do.	28,000	4 00		
85	1854	Cumberland	Md.	60,000	50	3	Do.	6,000	4 00		
86	1857	Danbury	Ct.	50,000	25	4	Do.	2,000	3 75		
87	1856	Danville	Pa.	30,000	25	—	June & Dec.	3,000	4 00		
88	1855	Davenport	Iowa.	56,000	100	—	Do.	6,000	5 00		
89	1848	Dayton	O.	50,000	25	5	Feb. & Aug.	8,000	3 50		
90	1853	Dedham	Mass.	40,000	50	—	Jan. & July.	3,000	4 00		
91	1860	Delaware	O.	30,000	25	—	Do.	2,500	3 00		
92	1849	Detroit	Mich.	500,000	50	5	Do.	30,000	3 50		
93	1860	Dobbs' Ferry	N. Y.	25,000	—	—	Do.	3,000	4 00		
94	1854	Dorchester	Mass	150,000	100	—	Jan. & July.	14,000	4 00		
95	1859	Dover	Del.	12,000	—	—	Private Works	2,000	4 00		
96	1857	Doylestown	Pa.	50,000	—	—	Jan. & July.	3,000	4 00		
97	1854	Dubuque	Iowa.	100,000	50	—	Do.	17,000	4 50		
98	1858	East Boston	Mass.	133,000	25	4	Do.	20,000	3 50		
99	1858	East Greenwich	R. I.	11,200	100	15	Do.	3,000	7 00	Rosin.	
100	1861	East Hampton	Mass.	10,000	25	—	Do.	5,000	9 00	Rosin.	
101	1861	East New York	N. Y.	50,000	50	—	Do.	12,000	3 50		
102	1857	Easton	Md.	9,000	10	—	Jan. & July.	1,500	7 00	Rosin.	
103	1850	Easton	Pa.	125,000	50	4	June & Dec.	6,000	3 60		
104	1856	Eastport	Me.	50,000	55	—	Do.	3,000	4 00		
105	1855	Elizabeth	N. J.	100,000	20	4	Jan. & July.	14,000	3 50		
106		Ellicott's Mills	Md.	10,000	—	—	Do.	4,000	4 00		
107	1852	Elmira	N. Y.	50,000	25	3½	Do.	5,000	4 00		
108	1852	Erie	Pa.	68,000	50	3½	June & Dec.	10,000	3 00		
109	1833	Evansville	Ind.	60,000	50	4	Jan. & July.	12,000	4 00		
110		Exeter	N. H.	60,000	—	—	Do.	12,000			
111	1847	Fall River	Mass.	26,000	—	—	Private Works	12,000	3 50		
112	1859	Fayetteville	N. C.	25,000	100	6	Jan. & July.	7,000	6 00	Rosin.	
113		Fifth Ward (Milwau.)	Wis.	50,000	25	—	Do.	10,000	4 00		
114	1857	Fishkill	N. Y.	10,000	20	—	April & Oct.	1,500	6 00	Rosin.	
115	1853	Fitchburg	Mass.	100,000	50	3	Jan. & July.	5,000	4 00		
116	1859	Flemington	N. J.	20,000	—	—	Do.	3,000	4 00		
117	1855	Flushing	N. Y.	40,000	50	1¼	Mar. & Sept.	6,500	4 00		
118	1858	Fort Wayne	Ind.	50,000	25	—	Do.	6,000	4 00		
119	1851	Frankfort	Ky.	30,000	—	—	City Works.	5,500	4 50		
120	1851	Frederick City	Md.	36,000	100	—	Jan. & July.	5,000	6 70		
121	1854	Fredericksburg	Va.	72,500	50	5	Do.	4,500	4 00		
122	1858	Fredonia	N. Y.	10,000	100	—	Do.	2,000	4 00		
123	1856	Freeport	Ill.	20,000	100	—	May & Nov.	10,000	4 00		
124	1859	Fremont	O.	25,000	25	—	Do.	2,000	4 50		
125	1858	Fulton	N. Y.	12,000	100	—	Do.	4,000	7 00	Rosin.	
126	1855	Galena	Ill.	70,000	100	—	May & Nov.	8,000	4 00		
127	1859	Galion	O.	25,000	25	—	Jan. & July.	1,800	3 00		
128	1858	Galveston	Texas	150,000	50	—	May & Nov.	7,000	6 00		
129	1854	Gardiner	Me.	100,000	50	4	Do.	8,000	4 00		
130	1853	Geneva	N. Y.	75,000	25	2½	Do.	6,000	4 00		
131	1851	Germantown	Pa.	Merged	into	the	Philad. Works.	12,000	2 25		
132	1859	Gettysburg	Pa.	20,000	50	3	Jan. & July.	2,500	4 00		
133	1854	Glenn's Falls	N. Y.	35,000	50	3	Feb. & Aug.	4,000	4 00		
134	1854	Gloucester	Mass.	40,000	50	—	Jan. & July.	5,000	3 50		
135	1857	Gloversville	N. Y.	15,000	25	—	Do.	3,000	3 50		
136	1858	Grand Rapids	Mich.	50,000	20	—	Do.	3,000	4 00		
137	1855	Great Barrington	Mass.	5,000	100	5	April & Oct.	2,000	7 00	Rosin.	
138	1849	Great Falls	N. H.	50,000	100	3	Do.	3,000	4 00		
139	1860	Greenfield	Mass.	20,000	50	2	Jan. & July.	2,500	4 00		
140	1855	Greenpoint	N. Y.	100,000	50	5	Do.	20,000	3 00		
141	1859	Greensboro'	N. C.	12,000	50	—	April & Oct.	3,000	7 00	Rosin.	
142	1858	Greensburg	Pa.	30,000	25	3	May & Nov.	2,000	3 00		
143	1854	Hagerstown	Md.	15,000	20	—	Jan. & July.	2,000	6 00		
144	1859	Hannibal	Mo.	100,000	100	—	Do.	6,000	3 50		
145	1857	Harlem	N. Y.	350,000	50	3½	Do.	25,000	3 00		
146	1855	Harrisburg	Pa.	100,000	—	4	Do.	5,000	4 00		
147	1849	Hartford	Ct.	200,000	25	4	Do.	25,000	3 00		
148	1853	Haverhill	Mass.	50,000	50	—	Do.	5,000	4 00		
149	1859	Haverstraw	N. Y.	20,000	100	—	Do.	5,000	4 00		
150	1861	Hayesville	Mass.	15,000	25		Do.	4,000	4 00		
151	1859	Hempstead	N. Y.	16,000	25	—	Do.	1,000	4 00		
152	1856	Hollidaysburg	Pa.	30,000	25	3	Do.	4,000	3 50		
153	1861	Holyoke	Mass.	20,000	25	—	Do.	3,000	4 00		
154	1861	Homer & Cortlandt	N. Y.	40,000	100	—	Do.	6,000	4 00		
155	1854	Honesdale	Pa.	30,000	25	3	Do.	2,500	4 00		
156	1860	Hornellsville	N. Y.	12,000	50	—	Do.	2,000	4 00		
157	1853	Hudson	N. Y.	50,000	100	3½	Feb. & Aug.	3,000	4 00		
158	1857	Huntington	Pa.	18,000	50	3	Do.	2,000	3 50		
159	1856	Huntsville	Ala.	7,325	25	—	June & Dec.	2,000	5 00		
160		Indianapolis	Ind.	150,000	—	—	Do.	15,000	5 00		
161	1857	Iowa City	Iowa.	40,000	50	—	Feb. & Aug.	4,000	4 50		
162	1852	Ithaca	N. Y.	75,000	25	2½	Jan. & July.	6,000	4 00		
163	1857	Jackson	Mich.	25,000	50	5	Do.	6,000	3 50		
164		Jackson	Miss.	80,000	50	—	Do.	4,000	4 50		
165		Jackson	Cal.	50,000	30	—	Do.	4,000	10 00		
166		Jacksonville	Flor.	30,000	20	—	Do.	2,000	7 00	Rosin.	
167		Jacksonville	Ind.	50,000	50	—	Do.	4,000	5 00		
168	1858	Jacksonville	Mo.	25,000	25	—	Do.	7,000	6 00		
169	1856	Jamaica	N. Y.	20,000	—	4	Do.	6,000	4 00		
170	1858	Jamaica Plain	Mass.	10,000	100	4	Do.	3,000	4 00		
171		Jamestown	N. Y.	25,000	—	—	Do.	4,000	4 00		
172	1856	Janesville	Wis.	50,000	100	—	Jan. & July.	12,000	4 00		
173		Jeffersonville	Md.	30,000	25		Do.	4,000	4 00		
174	1853	Jersey Ct. & Hoboken	N. J.	300,000	—	5	Do.	30,000	3 00		
175	1858	Jersey Shore	Pa.	15,000	25	—	Do.	2,000	3 70		
176	1856	Johnstown	Pa.	80,000	25	3	Do.	8,000	3 00		
177	1857	Joliet	Ill.	300,000	100	—	June & Dec.	6,000	4 00		
178	1858	Kalamazoo	Mich.	30,000	50	5	Do.	10,000	4 00		
179	1860	Keene	N. H.	60,000	100	—	Do.	4,500	4 00		
180	1855	Keokuk	Iowa	100,000	100	—	Jan. & July.	10,000	4 50		
181	1855	Kingston	Pa.	50,000	50	—	Do.	3,000	4 00		
182		Kittanning	Pa.	20,000	—	—		5,000	4 00		
183	1854	Knoxville	Tenn.	68,000	—	—	April & Oct.	4,000	5 00		
184	1860	Laconia	N. H.	20,000	100	—	Do.	4,000	6 00		
185	1859	La Crosse City	Wis.	100,000	50	—	June & Dec.	10,000	5 00		
186	1854	Lafayette	Ind.	60,000	50	4	Jan. & July.	8,000	3 25		
187	1856	Lambertville	N. J.	30,000	25	—	Do.	2,600	4 00		
188	1849	Lancaster	Pa.	100,000	50	4	Do.	10,000	3 00		
189	1856	Lancaster	O.	25,000	100	5	Do.	5,000	3 50		
190	1855	Lansingburg	N. Y.	25,000	100	—	Private Works	7,000	4 00		
191	1849	Lawrence	Mass.	200,000	100	4	Feb. & Aug.	15,000	3 50		
192	1859	Leavenworth	Kans.	200,000	25	—	Jan. & July.	10,000	5 00		
193	1856	Lebanon	Pa.	25,000	50	—	Feb. & Aug.	5,000	4 00		
194	1861	Le Roy	N. Y.	25,000	50	—	Do.	4,000	4 00		
195	1858	Lewisburg	Pa.	20,000	100	—	Jan. & July.	4,000	4 00		
196	1856	Lewiston	Me.	100,000	20	3	Do.	6,000	4 00		
197	1856	Lewistown	Pa.	30,000	50	3	April & Oct.	3,000	3 10		
198	1853	Lexington	Ky.	100,000	25	4	Jan. & July.	5,000	4 00		
199	1853	Little Falls	N. Y.	112,000	25	—	Do.	3,500	7 00	Rosin.	
200	1861	Little Rock	Ark.	20,000	—	—	Do.	5,000	6 00		
201	1858	Lockhaven	Pa.	28,000	—	—	Jan. & July.	3,000	4 00		
202		Lockport	N. Y.	100,000	50	—	Do.	4,000	4 00	Water	
203	1838	Louisville	Ky.	600,000	50	6	Do.	80,000	2 50		
204	1849	Lowell	Mass.	200,000	25	5	Do.	50,000	3 25		
205	1852	Lynchburg	Va.	70,000	25	5	Do.	6,000	3 80		
206	1852	Lynn	Mass.	55,000	50	4	Do.	20,000	4 00		
207	1859	Lyons	N. Y.	30,000	100	—	Do.	4,000	4 00		
208	1852	Macon	Ga.	75,160	25	6	Do.	5,000	5 00		
209	1851	Madison	Ind.	160,000	25	3	Do.	10,000	3 50		
210	1855	Madison	Wis.	100,000	25	—	Do.	5,000	5 00		
211	1854	Malden & Melrose	Mass.	50,000	25	3	Feb. & Aug.	5,000	4 00		
212	1852	Manayunk	Pa.	40,000	100	—	Do.	7,000	4 00		
213	1852	Manchester	N. H.	100,000	100	5	Jan. & July.	25,600	3 00		
214	1830	Manhattan (N. Y. Cy.)	N. Y.	4,000,000	50	5	Do.	600,000	2 50		
215		Mansfield	O.	25,000	—	—	Do.	10,000	4 00		
216	1854	Marblehead	Mass.	40,000	100	3	Do.	1,000	4 00		
217		Marlboro'	Mass.	20,000	—	—	Do.	8,000	4 00	Water	
218		Mauch Chunk	Pa.	50,000	50	—	Do.	7,000	4 00		
219	1857	Marietta	O.	50,000	50	—	Do.	7,000	4 00		
220	1858	Marysville	Cal.	50,000	100	—	Jan. & July.	4,000	12 50		
221	1857	Massilon	O.	20,000	25	—	Do.	5,000	3 00		
222	1855	Meadville	Pa.	39,500	25	—	Do.	4,000	3 50		
223		Medina	N. Y.	2,000	100	—	Do.	2,000	7 00	Rosin.	
224	1852	Memphis	Tenn.	300,000	100	5	June & Dec.	12,000	3 50		
225	1859	Metropol's (N. Y. Cy.)	N. Y.	1,000,000	—	—	Being Built.		—		
226	1859	Middleboro'	Mass.	15,000	—	—	Private Works		6 00	Rosin.	
227	1853	Middletown	Ct.	50,000	25	3	March & Sept.	5,000	3 80		
228		Middletown	N. Y.	10,000	25	—	Do.				
229		Milford	Mass.	20,000	—	—	Do.		4 00		
230		Milledgeville	Ga.	100,000	50	—	Do.		5 00		
231	1847	Milwaukee	Wis.	400,000	50	5	Jan. & July.	24,000	3 50		
232	1852	Mobile	Ala.	200,000	—	—	Do.	30,000	4 50		
233	1836	Monroe	Mich.	40,000	50	—	Do.	5,000	3 50		
234	1852	Montgomery	Ala.	100,000	25	4	Feb. & Aug.	7,000	6 00		
235	1856	Montpelier	Vt.	30,000	25	3	Jan. & July.	5,000	4 50		
236	1859	Morrisania	N. Y.	30,000	50	—	Do.		4 00		
237	1859	Morristown	N. J.	18,000	50	—	Do.	3,500	4 00		
238	1854	Mount Holly	N. J.	16,650	25	3	April & Oct.	2,000	7 00		
239		Mount Vernon	O.	50,000	100	—	Do.		4 00		
240	1857	Muscatine	Iowa.	50,000	100	—	Jan. & July.	3,000	4 50		
241	1854	Nantucket	Mass.	50,000	100	3	Feb. & Aug.	6,000	4 00		
242	1852	Nashau	N. H.	45,000	50	3½	Jan. & July.	10,000	3 50		
243	1850	Nashville	Tenn.	200,000	50	5	Do.	25,000	3 50		
244	1858	Natchez	Miss.	46,000	50	—	Do.	20,000	5 00		
245	1852	New Albany	Ind.	200,000	50	3½	Do.	16,000	3 50		
246	1846	Newark	N. J.	362,000	50	5	Do.	45,000	3 62		
247	1856	Newark	O.	30,000	100	—	Do.	7,000	5 42		
248	1852	New Bedford	Mass.	130,000	100	5	Do.	15,000	2 90		
249	1859	Newbern	N. C.	22,000	100	6	Do.	6,000	3 50		
250		New Britain	Ct.	30,000	20	5	Do.	8,000	4 00		
251	1851	New Brunswick	N. J.	100,000	20	4	Do.	8,000	3 00		

TABLE OF GAS-LIGHT COMPANIES IN THE UNITED STATES.

Compiled from official sources expressly for the AMERICAN GAS-LIGHT JOURNAL.

No.	Chartered.	Town.	State.	Chart'd Capital.	Per Sh. $	Sem An'l Div.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Rosin, Coal, or Water
252	1852	Newburg	N. Y.	67,000	20	4	Jan. & July.	10,000	4 00	
253	1852	Newburyport	Mass.	150,000	10	4	Do.	9,000	4 00	
254	1857	Newcastle	Del.	32,300	10	3	Do.	4,000	4 00	
255	1847	New Haven	Ct.	250,000	25	4	Do.	30,000	3 00	
256	1853	New London	Ct.	70,000	50	3	Do.	12,000	4 00	
257	1835	New Orleans	La.	1,500,000	100	6	Do.	120,000	4 50	
258	1853	Newport	R. I.	130,200	100	4	Do.	10,000	3 50	
259	1854	Newton & Watertown	Mass.	300,000	100	2	Do.	10,000	4 00	
260		Newton	N. J.	30,000	—	—	Do.	3,000	4 00	
261		Newton	Pa.	20,000	50	—	Do.	2,500	4 00	
262	1823	New York	N. Y.	1,000,000	50	5	May & Nov.	100,000	2 50	
263	1859	Niagara Falls	N. Y.	15,000	25	—	Do.	3,000	4 00	
264		Norfolk	Va.	60,000	25	—	Do.	40,000	4 00	
265	1853	Norristown	Pa.	41,700	25	4	June & Dec.	8,000	3 50	
266	1855	North Attleboro'	Mass.	50,000	100	3	Do.	6,000	4 00	
267		Northern Liberties	Pa.	400,000	25	7½	Mar. & Sept.	40,000	2 50	
268		North Adams	Mass.	25,000	—	—	Do.	30,000	4 00	
269	1856	Northampton	Mass.	35,000	25	3	Jan. & July.	4,500	4 00	
270	1859	North Bridgewater	Mass.	16,000	00	4	June & Dec.	1,000	7 00	Rosin.
271	1856	Norwalk	Ct.	30,000	150	4	Feb. & Aug.	6,000	4 00	
272	1859	Norwalk	O.	30,000	25	—	Jan. & July.	4,000	4 00	
273	1854	Norwich	Ct.	75,000	25	3½	Do.	12,000	3 50	
274	1861	Norwich	N. Y.	12,000	50	—	Do.	2,500	4 00	
275	1859	Nyack	N. Y.	20,000	100	—	Do.	2,500	4 00	
276	1860	Oberlin	O.	10,000	—	—	Do.	1,200	4 00	
277	1855	Ogdensburg	N. Y.	75,000	50	5	Do.	9,000	4 00	
278	1859	Orange	N. J.	65,000	25	—	Do.	6,000	3 50	
279	1852	Oswego	N. Y.	81,250	100	3½	Do.	15,000	4 00	
280	1855	Ottawa	Ill.	45,000	100	6½	Do.	6,000	4 00	
281	1856	Owego	N. Y.	40,000	50	3½	Do.	5,000	4 00	
282	1860	Owensboro'	Ky.	25,000	25	—	Do.	4,000	3 50	
283	1856	Paducah	Ky.	75,000	100	—	May & Nov.	4,000	5 00	
284	1845	Painsville	O.	200,000	50	5	Do.	2,500	5 00	
285	1856	Palmyra	N. Y.	12,000	5	—	Jan. & July.	3,000	7 00	Rosin.
286	1847	Paterson	N. J.	110,000	50	3	Do.	13,000	3 50	
287	1850	Pawtucket	R. I.	75,000	50	4	Do.	12,000	3 00	
288	1853	Peekskill	N. Y.	31,000	50	3	June & Dec.	4,000	4 00	
289	1860	Penn Yan	N. Y.	12,000	50	5	Do.	3,000	4 00	
290	1859	Peoples', Chicago	Ill.	500,000	50	New	Do.	100,000	2 50	
291	1855	Peoria	Ill.	100,000	50	4	Do.	8,000	3 50	
292	1852	Petersburg	Va.	120,000	—	5	Jan. & July.	20,000	3 80	
293	1841	Philadelphia	Pa.	3,000,000	50	—	City Works.	650,000	2 25	
294	1855	Piqua	O.	50,000	50	—	Jan. & July.	6,500	4 00	
295	1835	Pittsburg	Pa.	300,000	100	5	Do.	60,000	1 50	
296	1854	Pittsfield	Mass.	50,000	100	5	Do.	4,500	4 00	
297	1858	Placerville	Cal.	30,000	50	—	Do.	4,500	10 00	
298	1860	Plainfield	N. J.	25,000	50	—	Do.	2,500	4 00	
299	1859	Plattsburg	N. Y.	16,000	50	—	Jan. & July.	5,000	7 00	Rosin.
300	1853	Plymouth	Mass.	40,000	100	—	April & Oct.	8,000	4 00	
301	1860	Port Chester	N. Y.	50,000	50	—	Do.	4,000	4 00	
302	1860	Port Jervis	N. Y.	20,000	100	—	Do.	3,000	4 00	
303	1849	Portland	Me.	300,000	50	4	Jan. & July.	30,000	3 00	
304	1859	Portland	Oreg.	50,000	50	—	Do.	3,500	8 00	
305	1859	Port Lavacca	Texas	50,000	100	—	Do.	2,500	7 00	
306	1851	Portsmouth	N. H.	70,000	100	8	April & Oct.	6,500	3 70	
307	1855	Portsmouth	O.	50,000	50	4	Jan. & July.	10,000	3 50	
308	1855	Portsmouth	Va.	100,000	50	4	Do.	4,000	4 00	
309	1856	Pottstown	Pa.	20,000	50	3	Do.	3,500	4 00	
310	1850	Pottsville	Pa.	110,000	50	2	Do.	10,000	3 50	
311	1850	Poughkeepsie	N. Y.	84,000	25	4	Mar. & Sept.	15,000	3 50	
312	1848	Providence	R. I.	1,000,000	50	4	Jan. & July.	63,000	3 00	
313	1853	Quincy	Ill.	300,000	50	4	June & Dec.	12,000	3 50	
314	1855	Racine	Wis.	43,500	26	—	Do.	7,000	3 50	
315	1857	Rahway	N. J.	50,000	20	—	Jan. & July.	5,000	4 00	
316	1858	Raleigh	N. C.	25,000	100	6	May & Nov.	5,000	6 00	Rosin.
317	1848	Reading	Pa.	100,000	25	4	Jan. & July.	25,000	3 00	
318	1851	Richmond	Va.	341,975	—	—	City Works.	30,000	3 00	
319	1859	Richmond	Mass.	40,000	25	—	Jan. & July.	3,000	4 00	
320	1859	Ripley	O.	30,000	50	—	Do.	2,000	4 50	
321	1852	Rochester	N. Y.	200,000	50	5	Do.	50,000	2 50	
322	1857	Rockford	Ill.	40,000	50	—	Do.	4,000	4 00	
323	1854	Rock Island	Ill.	100,000	50	—	Do.	6,000	4 50	
324	1854	Rockland	Me.	50,000	100	—	Do.	6,000	4 42	
325	1852	Rome	N. Y.	35,000	100	3½	Do.	10,000	3 60	
326	1854	Rondout and Kingston	N. Y.	65,150	20	3½	June & Dec.	10,000	3 80	
327	1854	Roxbury	Mass.	150,000	100	5	Jan. & July.	20,000	3 50	
328	1859	Rutland	Vt.	20,000	25	—	Do.	4,000	3 50	
329		Saco	Me.	71,600	100	3½	April & Oct.	8,000	4 00	
330	1857	Sacramento	Cal.	500,000	100	—	Do.	40,000	10 00	
331	1859	Sag Harbor	N. Y.	20,000	—	—	Do.	4,000	4 00	
332	1858	Saint Albans	Vt.	15,000	20	—	Do.	3,000	7 00	Rosin.
333		Saint Johnsbury	Vt.	30,000	25	—	Do.	4,000	4 00	
334	1857	Saint Joseph	Mo.	50,000	100	5	Jan. & July.	6,000	5 00	
335	1839	Saint Louis	Mo.	600,000	50	—	June & Dec.	180,000	3 50	
336	1857	Saint Paul	Min.	200,000	50	3	Jan. & July.	10,000	6 00	
837	1856	Salem	N. J.	30,000	25	3	Do.	5,000	3 86	
338	1850	Salem	Mass.	200,000	100	4	Feb. & Aug.	30,000	3 24	
339	1859	Salem	O.	25,000	20	—	Do.	3,000	3 00	
340	1859	Salisbury	N. C.	14,600	50	6	May & Nov.	3,500	6 00	Rosin.
341		Salisbury Mills	Mass.	1,250	25	—	Do.	3,000	4 00	
342		Salmon Falls	Me.	25,000	100	—	May & Nov.	3,000	4 00	
843		San Antonio	Texas	75,000	20	—	Do.	40,000	6 00	
344		San Diego	Cal.	30,000	50	—	Do.	50,000	10 00	
345	1854	Sandusky	O.	75,000	50	—	April & Oct.	9,000	3 00	
346	1859	Sandwich	Mass.	10,000	—	—	Private Works	2,000	3 50	
347	1852	San Francisco	Cal.	1,000,000	100	6	Do.	200,000	8 00	
348	1853	Saratoga Springs	N. Y.	39,000	100	—	Jan. & July.	6,000	3 60	
349		Saugerties	N. Y.	30,000	20	—	Do.	4,000		
350	1849	Savannah	Ga.	200,000	25	5	Jan. & July.	10,000	3 75	
351	1851	Schenectady	N. Y.	50,000	—	—	Private Works	11,000	4 00	
352	1858	Scranton, Gas & Water	Pa.	100,000	25	—	Jan. & July.	6,000	3 80	
353	1857	Selma	Ala.	20,000	100	—	Do.	2,000	5 00	
354	1856	Seneca Falls	N. Y.	80,000	50	2	Do.	6,000	4 00	
355		Shreveport	La.	40,000	25	—	Do.	3,000	4 50	
356	1856	Sing Sing	N. Y.	40,000	100	—	Do.	3,000	4 00	
357	1860	South Adams	Mass.	10,000	25	—	Do.	3,000	4 00	
358	1859	South Bridge	Mass.	5,000	25	—	Do.	4,000	6 00	
359		South Boston	Mass.	200,000	50	—	Do.	60,000	3 25	
360		Springfield	O.	200,000	100	—	Do.	20,000	3 50	
361	1854	Springfield	Ill.	75,000	50	—	Jan. & July.	10,000	3 50	
362	1848	Springfield	Mass.	100,000	500	5	Feb. & Aug.	10,000	3 60	
363	1855	Stamford	Ct.	6,250	25	5	April & Oct.	3,000	3 50	
364	1857	Staten Island	N. Y.	150,000	50	5	Jan. & July.	26,000	4 00	
365	1859	Staunton	Va.	18,000	50	6	Do.	4,000	7 00	Rosin.
366		Steubenville	O.	150,000	100	—	Do.	15,000	4 00	
367		Stockton	Cal.	50,000	—	—	Do.	8,000	10 00	
368	1848	Syracuse	N. Y.	125,000	25	5	Mar. & Sept.	25,000	3 00	
369		Tamaqua	Pa.	40,000	25	—	Do.	3,000	4 00	
370	1859	Tarrytown & Irvingt'n	N. Y.	70,000	50	—	Jan. & July.	3,000	4 00	
371	1853	Taunton	Mass.	100,000	50	4	Do.	10,000	4 00	
372		Terre Haute	Ind.	100,000	100	—	Do.	3,000	4 00	
373		Thompsonville	Ct.	25,000	50	—	Do.	4,000	4 50	
374		Tiffin	O.	25,000	20	—	Do.	4,000	4 00	
375	1858	Toledo	O.	100,000	50	3	Do.	8,000	3 50	
376	1847	Trenton	N. J.	100,000	20	4	Do.	15,000	3 60	
377	1848	Troy	N. Y.	200,000	100	4	June & Dec.	35,000	3 60	
378	1856	Urbana	O.	30,000	25	—	April & Oct.	3,500	4 00	
379	1849	Utica	N. Y.	80,000	100	4	Do.	22,000	3 60	
380	1853	Vicksburg	Miss.	66,000	50	—	Mar. & Sept.	4,000	4 50	
381	1859	Vincennes	Ind.	25,000	100	—	Jan. & July.	2,000	4 00	
382	1858	Walden	N. Y.	2,500	—	—	Private Works	1,000	6 00	Rosin.
383	1853	Waltham	Mass.	100,000	100	4	Jan. & July.	3,000	4 00	
384	1857	Ware	Mass.	30,000	20	—	Do.	3,500	4 00	
385	1854	Warren	R. I.	20,000	25	—	Do.	3,000	4 00	
386	1855	Washington	D. C.	500,000	20	5	Do.	50,000	3 25	
387	1859	Washington	N. C.	15,000	100	—	April & Oct.	1,500	6 00	Rosin.
388	1848	Washington	Pa.	20,000	25	4	Jan. & July.	4,000	3 00	
389	1854	Waterbury	Ct.	100,000	25	—	Do.	4,000	4 00	
390	1852	Waterford	N. Y.	12,000	25	—	Do.	4,000	4 00	
391	1852	Watertown	N. Y.	20,000	100	—	Do.	10,000	7 00	Rosin.
392	1856	Watertown	Wis.	25,000	100	—	Do.	5,000	5 00	
393	1858	Wautoma	Wis.	30,000	50	—	Do.	3,000	4 50	
394	1857	Waverly	Miss.	20,000	100	—	April & Oct.	4,000	5 00	
395	1854	West Cambridge	Mass.	60,000	100	—	Feb. & Aug.	10,000	4 00	
396	1852	We-tchester	Pa.	100,000	25	2½	Do.	3,500	3 50	
397		Westfield	Mass.	25,000	100	6	Do.	4,000	4,00	
398	1857	West Point	N. Y.	50,000	—	—	United States	Milit'ry	2 00	
399	1853	West Troy	N. Y.	100,000	50	3	Jan. & July.	10,000	3 60	
400	1850	Wheeling	Va.	75,000	25	6	Do.	12,000	2 70	
401	1853	Wilkesbarre	Pa.	50,000	50	—	May & Nov.	4,000	3 80	
402	1850	Williamsburg	N. Y.	500,000	50	5	Jan. & July.	60,000	3 50	
403	1858	Williamsburg	Va.	30,000	25	—	Do.	3,000	4 00	
404	1857	Williamsport	Pa.	70,000	25	4	Do.	3,500	3 80	
405	1859	Willimantic	Ct.	12,000	—	—	Do.	2,500	3 50	
406	1858	Wilmington	N. C.	60,000	50	5	Do.	8,000	5 00	
407	1852	Wilmington	Del.	200,000	50	5	Feb. & Aug.	20,000	3 00	
408	1854	Winchester	Va.	36,000	50	6	Jan. & July.	5,000	4 00	
409		Woburn	Mass.	20,000	—	—		3,000	4 00	
410	1856	Woodstock	Vt.	10,000	50	4	Jan. & July.	4,000	6 00	Rosin.
41	1853	Woonsocket	R. I.	82,600	100	4	April & Oct.	4,000	3 50	
412	1856	Wooster	O.	25,000	50	—	Jan. & July.	6,000	3 00	
413	1849	Worcester	Mass.	160,000	100	5	Do.	15,000	3 50	
414	1855	Xenia	O.	40,000	50	—	Do.	3,000	4 00	
415	1854	Yonkers	N. Y.	75,000	50	3½	Do.	6,500	4 00	
415	1849	York	Pa.	40,000	50	3	June & Dec.	10,000	3 50	
417		Yorkville	S. C.	20,000	25	—		4,000	4 00	
418	1858	Ypsilanti	Mich.	20,000	50	5	Feb. & Aug.	6,000	4 00	
419	1850	Yreka	Cal.	30,000	100	—	Do.	2,000	10 00	
420	1848	Zanesville	O.	44,000	25	4	Do.	10,000	3 50	

Gas-Light Companies in the British Provinces of North America.

No.	Chartered.	Town.	Province.	Chart'd Capital.	Per Sh. $	Sem An'l Div.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Rosin, Coal, or Water
1	1854	Belleville	C. W.	33,040	100	4	Jan. & July.	1,200	5 00	
2	1854	Brantford	C. W.	32,000	100	2½				
3		Brockville	C. W.	50,000	—	—		5,000	4 00	
4		Chatham	N. B.	50,000	—	—				
5	1854	Charlotte Town	P. E. I.	50,000	100	5	Jan. & July.	3,000	3 50	
6	1857	Cobourg	C. W.	30,000	—	—	Feb. & Aug.	4,000		
7		Dundas	C. W.	30,000	—	—		6,000	4 00	
8		Frederick	N. B.	50,000	—	—				
9	1843	Halifax	N. S.	160,000	40	7	May.	30,000	3 00	
10	1850	Hamilton	C. W.	125,000	40	5	Mar. & Sept.	20,000	3 50	
11	1848	Kingston	C. W.	80,000	100	—	Do.	6,000	3 50	
12	1853	London	C. W.	100,000	20	5	May & Nov.	5,000	5 00	
13	1847	Montreal	C. E.	300,000	40	—	Mar. & Sept.	80,000	3 00	
14	1854	Ottawa	C. W.	40,000	40	5	Do.	5,000	4 50	
15	1859	Point Levi	C. E.	25,000	25	—	Jan. & July.	4,000	3 50	
16	1859	Port Hope	C. W.	28,000	20	4	May & Nov.	4,500	3 50	
17	1847	Quebec	C. E.	200,000	200	4	Jan. & July.	60,000	3 00	
18	1848	Saint Catherine's	C. W.	80,000	20	—	May & Nov.	7,000	4 50	
19	1859	Saint Hyacinthe	C. E.	15,000	20	—	Do.	4,000	4 00	
20		Saint John	N. B.	170,000	80	—	June & Dec.	25,000	3 50	
21		Saint John's	N. F.	50,000	—	4	Do.	30,000		
22	1858	Sorel	C. E.	14,000	20	4	Do.	4,000	3 00	
23	1848	Toronto	C. W.	400,000	100	4	Feb. & Aug.	50,000	3 33¼	

Gas-Light Companies in Cuba, Mexico, South America, and New Zealand.

No.	Chartered.	Town.	State.	Chart'd Capital.	Per Sh. $	Sem An'l Div.	Dividends Payable.	Population of Gas District.	Price per 1000 Feet.	Rosin, Coal, or Water
		Callao	Chile.		—	—		20,000	7 00	
2		Cardenas	Cuba.	50,000	—	—	Jan. & July.	180,000	5 00	
3	1857	Compania Cubana	Hav.	500,000	500	10	Do.			
4		Cienfuegos	Cuba.		—	—	Do.	12,000	5 00	
5		Guanabacoa	Cuba.		—	—	Do.	14,000	5 50	
6		Regla	Cuba.		—	—	Do.	10,000	5 00	
7		Trinidad	Cuba.		—	—	Do.	16,000	5 00	
8		Guyaquil	S. A.	150,000	—	—	Do.	35,000		
9		Havana	Cuba.	1,250,000	500	7½	Do.	300,000	5 00	
10		Lima	Peru.	100,000	—	—	Do.	150,000		
11		Maranham (Chartered)			—	—				
12		Matanzas	Cuba.	50,000	—	—	Do.	180,000	8 50	
13		Mexico City	Mex.	550,000	—	—	Do.			
14		Montevideo	S. A.	500,000	—	—	Do.			
15		Para (Chartered)			—	—				
16	1854	Rio de Janeiro	S. A.	1,200,000	500	7½	Do.	300,000	4 00	
17		San Iago	Chile.	500,000	—	—	Do.	180,000	7 00	
18	1857	Saint Jago de Cuba	Cuba.	450,000	500	—	Do.	25,000	5 00	
19		Valparaiso	Chile.	500,000	—	—	Do.	85,000	6 00	
20		Vera Cruz	Mex.	500,000	—	—	Do.			
21		Ville Clara	Cuba.	50,000	—	—	Do.			
22		Auckland	N. Z.		—	—				

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WEDNESDAY, JANUARY 1, 1862.

The tables of gas-light companies in the United States, which will be found in another part of this issue of the JOURNAL, show a slight increase in number compared with the list published last year. Although this increase has not been so rapid as we should like to have seen it, yet it is gratifying that gas-lighting is making some progress, obeying in this respect the injunction of Friar Lawrence—

"Wisely and slow; they stumble that run fast."

In accordance with the sentiment thus expressed, it may be assumed that the movement, if slow, is at all events wise, and therefore not liable to sudden interruptions or retrogression. When the number of towns capable of supporting gas-works is taken into account, it by no means affords a subject for congratulation that so tardy a progress is made in introducing them and in practically convincing the people of the benefits of this method of illumination. In comparison with other countries, we are far behind. In England, Scotland, and Ireland, many insignificant villages have their gas-works, and some of them even boast of opposition companies in towns of such a size that in this country would be be deemed hardly capable of supporting a single establishment. However the latter state of affairs is to be deprecated, it affords an example of what a field for enterprise there is in this country, how such opportunities are seized elsewhere, and turned to a good account. The list of post-office towns in the United States which we have been publishing for some time, shows at a glance the extent of the field, and in many places there enumerated offers for the erection of gas-works would be gladly embraced by the people, provided they be made in a proper spirit, and if a moderate degree of success could be promised.

If, however, amid the other congratulations the opening of the new year occasions, we cannot indulge in expressions of decided gratification at the progress of the past twelvemonth; still there are abundant reasons for believing that among the engineers and superintendents of existing companies an increasing desire is manifested to attain perfection in all the details of the profession. A growing attention is being paid to those educational requirements which are indispensable to every thorough engineer; and a spirit of liberal inquiry, and a desire to adopt really valuable innovations has been manifested in numerous instances. The interrogations we receive relative to new technological publications, and the general tone of the letters of our correspondents, indicate an amelioration which is exceedingly gratifying.

Among other subjects which have received increased attention is that of photometry. We have frequently alluded to the importance of this science, and regretted that in many works it is altogether neglected. A decided improvemant is taking place in this respect, and photometry is receiving a portion, at least, of that care and study which is its due. As a result of this, it follows that the illuminating power of gas is improved, and the mixtures of coals more judiciously made; or, where but one variety of coal is used, the charges are worked off with much greater exactness, the indications of the photometer serving to act as a check on the whole operation.

To acquire expertness in photometry, it requires great care and precision in the manipulation. Most persons, unacquainted with the practice of this science, imagine it to be a perfectly easy work to perform, and to be learned in a short time. This is by no means the case. Even those who are familiar with the apparatus and accustomed to manipulate it, often notice discrepancies in their results, which must be corrected by repetitions. The registration of the experimental meter, the pressure of the gas, the burning of the candle, and all the minutiæ of conducting the research, must be most carefully attended to, and not the slightest inaccuracy be allowed to occur. To indicate all the details to be observed would require a treatise of no inconsiderable size. We hope, during the coming year, to present to the readers of the JOURNAL some practical remarks on photometrical testing, and to give a historical sketch of the different forms of photometers now used, with opinions as to their comparative value.

Although the great rebellion still rears its hydra head, and the land is filled with the insignia of warfare, yet the gas-light interest is not sensibly affected by it. While securities of other kinds rise and fall with the sensitiveness of the barometer, and the mere rumor of foreign complications gives unwonted impetus to the general downward movement of the market, gas-light shares remain unharmed and they are in even greater demand on account of their exemption from the general decline. This affords a pleasing picture, and shows that no apprehensions need be felt by holders of such securities.

In conformity with the good old Knickerbocker custom, the JOURNAL extends its hearty greeting to its many friends at the opening of this new year. In this connection we may be pardoned for indulging in a little talk of ourselves The number of our friends and patrons is on the increase, not only in this country, but in nearly every civilized nation in the world, and in many distant islands and colonies. Although by the suicidal act of rebellion many of our Southern friends are temporarily alienated from us, yet we hope soon again to greet them in their former relations, and to periodically disseminate among them the intelligence concerning those branches of science to which we pay particular attention. Until that time shall come, they will have an opportunity of ruminating in utter darkness upon their foolish conduct, and to wish themselves once more back in the family of States, from which they were driven by the wicked ambition of a few leading demagogues.

EXPLOSIVENESS OF COAL OILS.

We have before reverted to the liability of some kerosene or coal oils to explode. On page 136 of this volume the subject was commented on at some length, and the cause of the explosiveness pointed out. On account of the large consumption of these oils, and the implicit confidence which is generally placed in them as safe illuminating agents, this subject should be impartially discussed, and the public should be duly warned of the risk to be incurred from burning those which contain enough of the light hydrocarbons to render them dangerous.

In the last semi-annual report of Fire-Marshal BAKER, particular stress was laid upon the disastrous consequences of burning imperfectly refined oil. A number of fatal accidents have ensued from its use in this city, alone, and so destructive have been the conflagrations resulting from these accidents, that the marshal is almost disposed to regard kerosene oil, as even more dangerous than burning fluid. In this comparison, under present circumstances, the makers of perfectly rectified oil are liable to suffer with others less conscientious than they—the products of all manufacturers being deemed by the unthinking public, to be on a par, and if one be dangerous, the others must partake of a similar character. The injustice of this opinion must be manifest, as it causes the innocent to be classed with the guilty, and attaches an odium to the product of all.

When proper precautions are taken, there is no more necessity for kerosene oil to be of an explosive nature than whale or lard oils. It is true that it differs materially in its composition from these substances, and is susceptible of more varied changes; but this difference does not enhance its dangerous qualities. Although the competition which has sprung up among manufacturers has caused a marked reduction in the price, yet there are those whose product will stand the severest scrutiny, and the safety of which will be vindicated in every risk to which it may be exposed. On another page we publish a letter from Mr. H. PEMBERTON, superintendent of the chemical works of the Pennsylvania Salt Manufacturing Company, whose establishment is situated near Pittsburgh, Pa. The statements made by this gentleman agree in the main with our views expressed on page 136, and they will claim attention from the fact that the extended practical experience of the writer, constitutes him an expert whose opinion may be valued. The reference to the fire at the Duquesne depot of the Pennsylvania Railroad Company, at Pittsburgh, will afford a hint or two to officers of insurance companies, who have been much exercised of late on this subject, on account of fires having occurred in ships and elsewhere, where quantities of petroleum were stored, and which were erroneously attributed to spontaneous combustion.

There being so many proofs that kerosene oil "is dependent for its safety entirely upon the care and conscience of the manufacturer," it is time that those makers who exercise this "care and conscience" should be on the alert, and by their united efforts drive the dangerous stuff entirely out of the market. There are ways of doing this which, to render them successful, require but the concerted action of those who are willing to inaugurate a reform. Of these the most plausible is to apply for the passage of inspection laws, whereby a rigid examination would be prescribed, and heavy penalties exacted from those who fail to comply with the proper standard. Those makers who are satisfied of the purity of their own products would surely not oppose a measure of this kind, which would afford them a protection, and remove from them a large portion of the onus of competition which now falls most hurtfully upon them. A movement of this nature would undoubtedly receive a vigorous opposition from those manufacturers who are neither ruled by conscience nor by any other but sordid motives. The cupidity of these persons would prompt a violent resistance to any proposed means of ameliorating the condition of consumers,—their own selfish interests being the prominent points of study. The time has arrived when producers like these should be forced to relinquish their calling and embark in one more honorable in its nature, and entailing less danger and loss on the community.

In another column we also publish a report of the action of the Board of Fire Insurance Companies of this city. The consideration of this matter was left to a special committee of five gentlemen, officers of well-known companies. Their decision, which,

under the circumstances of the case, must be considered a just one, will create a feeling of disappointment among manufacturers of the articles enumerated, and many remonstrances will doubtless be made. As far as this action relates to rectified oils, the conscientious refiner may cast the whole odium upon those to whom it should properly attach—those who either ignorantly or wilfully make and vend oils which are palpably dangerous, and which should be driven from the market, accompanied by the anathemas of all.

We hear of movements being inaugurated in some other States having for their object the passage of a rigid inspection law, in which the tests to be employed are pointed out with particular emphasis. This course is eminently wise and proper, and we commend the consideration of this matter to the directors of those establishments where safe oil is manufactured, many of whom are constant readers of the JOURNAL. A concerted action on their part may accomplish much, and succeed, not only in ridding the community of impure and explosive mixtures, but also of lessening the competition, removing the prejudices which have sprung up against their products, and restoring it to that favor in which it was held but a year or two ago. It may be urged that a movement of this nature would put up the price of the material, and thus cause attention to be diverted to other articles. Most undoubtedly the price would be augmented, but this would not occasion a material diminution in consumption, for the public would far rather pay a fair price for an article in which confidence could be placed, than to buy at a low cost a fluid which is liable at any time to explode, and which can never be implicitly relied upon.

TABLES OF AMERICAN GAS-LIGHT COMPANIES.

The tables now presented show an aggregate of—

420 American Gas-Works, representing	...	51,620,940
23 British Colonial " "	...	2,112,040
22 Cuban & So. Am." "	...	6,350,000
465 Gas-Works. Total capital	.....	$60,022,980

Showing a grand total of Sixty million and twenty-two thousand nine hundred and eighty dollars, being an increase in this country since the date of our last tables, July 16, 1860, of 39 gas-works, and of capital Three million six hundred and forty-nine thousand seven hundred and twenty-five dollars.

RECAPITULATION.

	Rebel.	Loyal.
Alabama	327,325	
Arkansas	20,000	
California		1,790,000
Connecticut		988,250
Delaware		244,300
District of Columbia		500,000
Florida	30,000	
Georgia	559,160	
Illinois		3,015,000
Indiana		815,000
Iowa		411,000
Kansas		200,000
Kentucky		930,000
Louisiana	1,540 000	
Maine		1,070,300
Maryland		810,000
Massachusetts		5,138,850
Michigan		778,000
Minnesota		200,000
Mississippi	212,000	
Missouri		775,000
New Hampshire		475,000
New Jersey		1,936,650
New York		14,054,900
North Carolina	187,600	
Ohio		3,393,600
Oregon		50,000
Pennsylvania		6,014,700
Rhode Island		1,354,000
South Carolina	787,800	
Tennessee	663,000	
Texas	275,000	
Virginia	1,030,005	
Vermont		216,000
Wisconsin		825,500
	5,631,890	45,989,050
		5,631,890
Total		$51,620,940

CORRESPONDENCE.

GAS-HOLDERS ON STEAMBOATS.

Albany, N. Y., Dec. 19th, 1861.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

Although the reference made in the editorial comment—on dry gas-holders as used on New York steamboats—in your last number, (to wit, page 204 in the issue of January 1st, 1861,) explains that the gas-holders referred to are those having an air pumping chamber on one side of a vertical rubber diaphragm, and a chamber for gas on the other side. Still, as your condemnation is general in its terms, and, if unexplained, will be understood as applying to all dry gas-holders used on steamers, I am compelled to ask you to publish the following description of the Aubin dry gas-holder—the kind generally used—the use of the combined air and gas apparatus (an inferior device to get around the Aubin patent merely) being confined, as far as I know, to the steamer *Commonwealth*, referred to by you, and some of the boats of the Jersey City Ferry Company. I ask this, first, because otherwise serious loss will result to me as the present owner of the Aubin patent; and, secondly, because if the great influence of your JOURNAL is cast against the use of dry gas-holders without discrimination, the introduction of gas-light on steamboats and railroads will be much retarded, to the prejudice of the public.

The Aubin dry gas-holder is composed of a lower tank or tub made of iron and closed at the bottom, and an upper vessel made of rubber with a metal plate for a top. These two parts are joined together at their open ends, and so adapted to each other that the flexible rubber side of the upper vessel descends into the lower metal tank, or ascends above it, as the gas enters into or flows from the gas-holder—the inflow being caused, of course, by the pressure from the city mains when the holder is temporarily connected with them, and the weighted metal top plate (after the holder has been filled and disconnected from the street pipe) gradually causing the gas to flow out through the burners as required.

Thus you see the arrangement is perfectly safe, because the pressure being *always outwards*, no air can get mixed with the gas. There is therefore no more danger from explosions with this gas-holder than with the ordinary water-tank gas-holder. Even if a slit was cut in the rubber, the weighted top being free, and always resting on the gas, there would only be a mere rapid escape of gas through the rent, but no explosion. It is not necessary, however, to expose the rubber to the above risk, as a case of common sheet-iron around it, open at the top, will protect it effectually, and serve as a chimney to conduct off any smell from leakage if any should occur.

Again, you speak in general terms of the rubber being liable to corrode, crease, &c. These objections, where they apply, I know are fatal, and although I admit gas-tar will act powerfully on rubber when in constant contact with it, the construction of the Aubin holder was devised to meet that very difficulty, and it has done so successfully, as you can ascertain from the several ferry companies using it. The Union Ferry Company have informed me that after two years use they found the rubber unstained even and as good as new.

To understand why this is so, you need only visit the boats and see how the apparatus works. The holder being of larger diameter at the centre than at either end, the rubber curves, but don't fold, and never descends where tar is condensed. Your remarks, therefore, although they may apply to other dry gas-holders, do not apply to mine, and consequently I ask you to correct the effect of them by publishing this letter.

In conclusion, will you permit me to add, that in my opinion the compression cylinders referred to by you and used on some of our railroads, are inferior to a good dry gas-holder even on the score of safety, and certainly are more so as far as convenience is concerned, as one is required for each car, whereas one dry gas-holder in one end of the baggage car, by the use of flexible tubes, will supply an entire train.

In the hope that you will find time to visit the ferry boats as I have suggested, or can call upon Messrs. J. O. Morse & Co., who have constructed and understand the Aubin holder, for such information as will enable you to judge of the facts to which I have called your attention, I remain very truly yours, H. Q. HAWLEY.

STANDARD BURNERS.

Is it right to adopt one kind of gas-burner, as a standard, to be used in testing the illuminating power of gas, by all gas-light companies in the United States? Would it not be more just to allow each company to select the burner found to be best adapted for the consumption of its own gas?

Some of the States and cities have enacted laws regulating the inspection of gas; it is most likely other States will follow their example ere long. The question whether one burner should be adopted and made the standard, or allow each gas company to choose the burner for the combustion of their own gas, is worthy of consideration.

The Parliament of England have adopted the 15-hole Argand burner, with a chimney 7 inches long, consuming 5 cubic feet an hour. The London Gas-Light Companies are required to furnish a gas which, when burned in this standard, is equal to the light of 12 sperm candles, 6 to the pound, and consuming 120 grains an hour.

The English House of Commons applied to the Gas Companies of England to report the power of the light furnished by each. They responded in the year 1857, and the report shows that the light ranges from 8 candles to 26 candles.

The Liverpool United Gas-Light Company, in their response, said they used "Wigan cannel-coal, and the quantity of 5 cubic feet of the quality of gas made by this Company cannot be burned in an ordinary Argand burner without producing smoke; and the Argand burner is not used in Liverpool."

The editor of the London *Journal of Gas-Lighting*, vol. 6, page 191, says, the Liverpool gas is too rich to be consumed in a 5 foot Argand burner without smoking; and, in commenting on the report of gas companies, says, "the information to be gained by this return will, it is to be hoped, have the effect of showing the chairman of the committee on unopposed bills the absurdity of attempting to force the same standard of quality into all gas bills. And we venture to submit to future legislative inquirers into the statistics of gas-works, that far more useful and practical information on the matter could be obtained by a return stating the description of burner best adapted for the combustion of the gas required to equal the light of 12 sperm candles, six to the pound, each of them consuming 120 grains of sperm per hour; and also the quantity of gas consumed by such burner, per hour, to produce such light at the Works of the Company, in a chamber colored dead black, and from which the light was excluded."

The City Council of Baltimore, this year, have adopted the English Parliamentary standard burner, but they require the light to equal 15 candles—three candles more light than is required from the London Gas Companies.

The State of Massachusetts enacted a law, this year, regulating Gas-Light Companies. This law very wisely provides—"Section 10—illuminating gas shall not be merchantable in this Commonwealth which has a minimum value of less than twelve candles; that is, a burner consuming five cubic feet per hour shall give a light, as measured by the photometric apparatus in ordinary use, of not less than twelve standard sperm candles, each consuming 120 grains per hour. *Every gas is to be tested with the burner, and under the pressure best adapted to it;* and the result shall be calculated at a temperature of 60° Fahr."

England, in adopting the Argand test burner, fixed on a suitable test for a gas of a low grade of illuminating power, possibly the best for a gas ranging from 8 candles to 12 candles; but we learn that this burner is entirely unsuited to the gas made by the Liverpool works, which, being made from cannel coal, is of high illuminating power. The Argand burner is not used in the city of Liverpool, neither is it used in the United States.

Why should a test burner be selected that is not used by the consumers of gas? This burner should be convenient, and in common use. What use is the information to consumers, when they learn that the gas burned by a peculiar and unusual burner yields a certain light, if the burner is inconvenient and not in general use? Had the Argand burner been adapted to American gas, no doubt its use would have been more general.

The test burner, then, ought to be one equally adapted for general use and the photometric test—a burner from which the highest illuminating power of the gas may be obtained. Gas, made by the different gas-works, may, and generally does, differ in quality. This may be partly owing to the mode of manufacture, but chiefly to the variety of coal; then one burner cannot be properly adapted to the gas of all the works. Each gas company should, after careful trials, select a burner that suits their gas for photometrical tests, and that may be conveniently adopted by their consumers.

The Steatite burners, hardened by the process of M. Schwartz, of Nuremburg, commonly called lava-tips, are incorrosive, extremely hard, and in all respects superior to iron burners. Some form of this burner would be well adapted as a test burner; and, generally, it will be found that a fish-tail Steatite burner, consuming from 4 to 5 cubic feet of gas per hour, under a pressure of from 4-10ths to 5-10ths, will give good results.

In legislating to regulate the inspection of gas, the law should provide that "every gas is to be tested with the burner, and under the pressure best adapted to it," burning from 4 to 5 cubic feet per hour; and the light of this quantity of gas shall, when made equal to 5 feet per hour by calculation, be equivalent to the light of — sperm candles, six to the pound, each consuming 120 grains per hour; or, if more or less, made equal to this consumption of grains per hour; the test to be made in a dark room, colored a dead black, with a Bunsen photometer, protected by a screen, the pressure under which the gas is tested noted, and the temperature of the room during such experiment.

C.

REPORTS OF GAS INSPECTORS.

BALTIMORE, MD.

For the week ending December 19, 1861.

Illuminating power, in Candles.	Sulphur, grs. in 100 cubic feet.	Ammoniacal Gas.	Sulphuretted Hydrogen Gas.	Carbonic Acid Gas.	Pressure in Main, Maximum.	Pressure in Main, Minimum.	Maximum illuminating power.	Minimum illuminating power.	Burning pressure during trial of Gas.	Bromine condensation per cent.
15.	less than 5 grains.	in excess.	none	none	$\frac{3.5}{10}$	$\frac{2.5}{10}$	15.5	13.9	$\frac{2}{10}$	5.

WILLIAM E. A. AIKIN,
Inspector of Illuminating Gas.

REMARKS.

Nothing particular to note except a satisfactory increase in the illuminating power of the gas, and an apparently unnecessary increase in the pressure. The maximum and minimum illuminating powers have been respectively 15.5 and 13.9 candles.

For the week ending December 26, 1861.

Illuminating power, in Candles.	Sulphur, grs. in 100 cubic feet.	Ammoniacal Gas.	Sulphuretted Hydrogen Gas.	Carbonic Acid Gas.	Pressure in Main, Maximum.	Pressure in Main, Minimum.	Maximum illuminating power.	Minimum illuminating power	Burning pressure during trial of Gas.	Bromine condensation per cent.
13.9	less than 5 grains.	in excess.	none	none	$\frac{3.2}{10}$	$\frac{2.1}{10}$	15.65	12.6	$\frac{2}{10}$	4.5

WILLIAM E. A. AIKIN,
Inspector of Illuminating Gas.

REMARKS.

The average illuminating power of the past week corresponds exactly with the minimum illuminating of the week preceding.

Dr. J. NORTHCOTE VINEN TO THE SURREY CONSUMERS' COMPANY OF LONDON, ENG.

1861. Week ending.	Number of Observations.	Miximum Light, Candles.	Minimum Light, Candles.	Average Light, Candles.
Nov. 9,	4	12.65	11.77	12.15
" 16,	4	14.19	12.27	13.09
" 23,	4	14.62	12.83	13.34
" 30,	4	12.23	11.90	12.07

The volume of hydrocarbons averaged from 4 to 4.75 per cent.; carbonic acid, 1 per cent.; there was no trace either of sulphuretted hydrogen, or of ammonia. The maximum pressure was 3 inches and 3-10ths; the minimum 6-10ths; the average working pressure was 1 inch and 3-10th.

DESCRIPTION OF A GAS FURNACE FOR GENERAL CHEMICAL USE.

BY JOHN JOSEPH GRIFFIN, F.C.S.

I have already published descriptions of several gas furnaces, adapted to special purposes.* The present notice refers to a simple form of gas-burner, which, aided by suitable fittings, can be used as a convenient source of heat for most operations of the chemical laboratory and lecture table. It will boil a quantity of liquid, exceeding two gallons at once; it will raise a 4¾-inch fire-clay crucible to full redness; it will fuse anhydrous carbonate of soda in greater quantity than is required for the analysis of a siliceous mineral; and it will melt small quantities of sterling silver. This amount of power is sufficient for most chemical operations that are not metallurgic.

THE GAS-BURNER.—Fig. 1 represents the gas-burner of this apparatus. The gas is supplied by the horizontal tube, whence it passes through a set of small holes into the box *a*, in which it mixes with atmospheric air that enters freely by the holes shown in the sketch. The gaseous mixture passes up the vertical tube *b*, and is inflamed at the top, where it burns with a single, tall, blue flame, which gives no smoke, very little light, but much heat. In this condition, the apparatus differs from "Bunsen's Gas-burner" only in size. *c* represents a thin brass cap, which fits the air-box *a*, but moves easily round it. *d* is a flat, cast-iron box, with many holes round the margin, and a few small ones on the top. This box fits loosely on the upper part of tube *b*, and when it is placed upon it, and the gas is lighted, the flame produced consists of a series of radiating jets, forming a horizontal circular flame of about 7 inches in diameter. Fig. 2—*a* shows a ring of horizontal flames thus produced, and *b* shows the single vertical flame.† The ring of flame is suited to the purpose of boiling and evaporation; the single flame to ignition and fusion. The height of the apparatus represented by Fig. 1 is 12 inches; the bore of the tube *b* is 1 inch; and the diameter of the fire-box *d* is 4 inches.

Fig. 1.

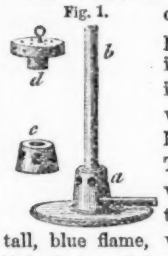
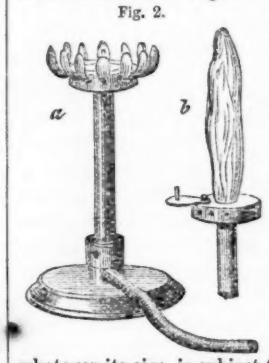


Fig. 2.



Bunsen's gas-burner, whatever its size, is subject to two defects: sometimes the flame burns white and smoky, and sometimes it blows down, the gaseous mixture explodes, and the gas then burns with a smoky flame in the air-box *a*, Fig. 1. The remedies for these defects are as follows: If the flame is white only when the gas is turned on very full, the remedy is to lessen the supply of gas; but if the flame continues to burn white at the top when the gas is gradually turned off, and the mass of flame slowly sinks, then the holes which deliver the gas from the supply pipe into the air-box are too large, and are placed too directly under the centre of the verticle tube *b*, Fig. 1, and these defects must be corrected in the instrument. Finally, when the flame blows down, it is because the supply of atmospheric air is too large in proportion to the supply of gas, and their relative proportions must be altered. To effect this alteration, the cap *c* is to be turned round on the air-box *a*, so as partially to close the holes, and thus lessen the supply of air. If, when the gas is alight, the flame needs to be lowered, first the supply of air is to be lessened, and then the supply of gas. If the flame is to be enlarged, first the supply of gas must be increased, and then the supply of air. In short, to prevent the flame blowing down, the gas must always be first placed in excess, and then have the proper quantity of air adjusted to suit it by means of the regulator *c*.

ARRANGEMENT FOR BOILING AND EVAPORATION.—Fig. 3 represents this gas furnace arranged for boiling and evaporation. *a* is the gas-burner, Fig. 1; *b*, an iron stool with three legs; *c*, a furnace body, or iron jacket, lined with plumbago or fire-clay. Fig. 4 shows the jacket and lining in section, and marks the position of the fire-box, *d*, of the gas-burner. This furnace is 14 inches high, and 9 inches in diameter. The three brackets fixed on the upper part of the jacket serve to support the vessel that contains the liquid that is to be boiled or evaporated. A porcelain basin of 16 or 18 inches in diameter can be thus supported. It is important to allow betwen the jacket *c* and the evaporating basin plenty of space for the escape of the heated air, which ascends from the interior of the furnace. When the evaporating basin is of small diameter, it may be supported on iron triangles, placed in the furnace *c*. Fig. 4 shows that, around the vertical tube of the gas-burner, *a*, there is in the bottom of the furnace, *c*, a circular opening, which is of 2 inches diameter, and through which air passes freely, partly to feed the flame and partly to be heated by the flame, and be directed upwards in a continuous current upon the lower surface of the basin that is to be heated. The flame within the furnace burns steadily. No side currents of air agitate it. No part of it touches, or must be permitted to touch, the basin, which should receive its heat solely from the mass of ascending hot air. The gas-burner thus arranged, and supplied by a gas-pipe of ¼ inch bore, burns about 33 cubic feet of gas in an hour, and the flame which it produces, acting upon water contained in an open porcelain evaporating basin, will heat from 60° to 212° F.,—

1 quart in 5 minutes,
1 gallon in 15 "
2 gallons in 30 "

and when the water boils it is driven off in steam at the rate of more than a gallon of water per hour. The method is consequently applicable to distillation on a small scale, and to numerous operations in pharmacy.

Fig. 3.

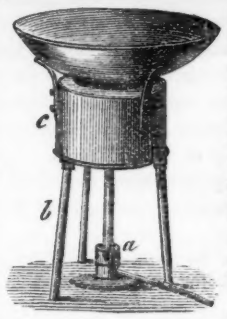
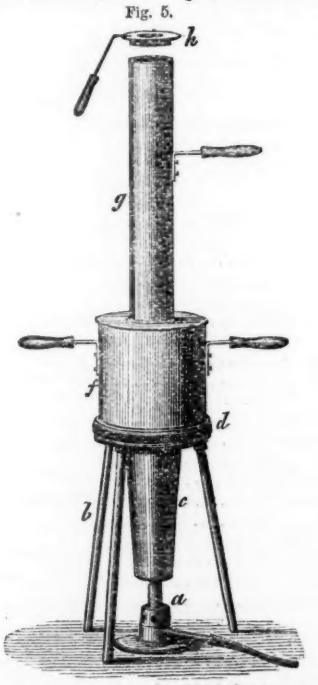


Fig. 4.

ARRANGEMENT FOR HEATING TO REDNESS A LARGE FIRE-CLAY CRUCIBLE.—When a large crucible is to be heated to redness—as, for example, when oxide of copper is to be dried for use in an organic analysis,—the gas-burner is to be used without the fire-box *d*, Fig. 1, and is to be arranged with the furnace fittings that are represented in perspective by Fig. 5, and in section by the lower part of Fig. 8, *a*, *b*, *c*, *d*. Letter *a* represents the gas-burner, Fig. 1; *b* is a tall iron stool; *c*, a chimney which collects atmospheric air to feed the flame, and leads it up close to the vertical tube, *b*, by which contrivance the air is warmed and the tube cooled; *d*

Fig. 5.



* See *Chemical News*, vol. i, p 27, and vol. iii, p. 333.

† Fig. 2 represents a small variety of this gas-burner, in which the head is not removable, but the efflux of the mixed gases is regulated by a sliding valve, which is represented by *b*.

is a furnace-sole or plate of fire-clay; *f* is a reverberatory dome, the interior of which is best shown in the section, Fig. 6; *e* is a cast-iron ring or trivet, represented more clearly in Fig. 7; *g* is an iron chimney, 24

Fig. 6.

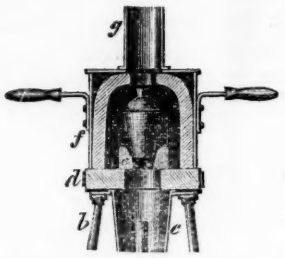


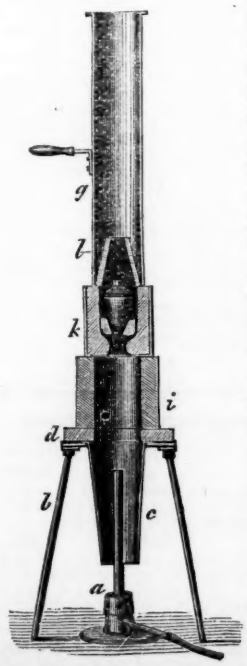
Fig. 7.

inches long, and 3½ wide; and *h*, a damper, to lessen the draught when small crucibles are to be heated. The height of this apparatus from *a* to the top of *f*, is 24 inches; and the external diameter of the dome *f* is about 8 inches. The crucible, which may be from 4¼ to 4¾ inches in height, is placed on the iron ring *e*, and that on the clay sole *d*, and it is then covered by the dome *f*. The gas should be lighted after the crucible is placed in its position, and before the dome is put on. The dome and chimney are then to be added, and the operation allowed to proceed. With a crucible of the above size, the damper *h* is not required; but it must be used when the crucible is under 4 inches in height, otherwise the draft occasioned by extra space within the dome causes the flame to blow down. The damper must be put on the chimney before the chimney is put on the dome. The iron ring, Fig. 7, or *e*, Fig. 6, suits crucibles of different sizes, according to the side of it which is turned uppermost.

The Figures show that a crucible mounted in this furnace can lose very little heat by radiation or conduction, and hence it is that a small gas flame produces a powerful effect. In half an hour a 4¾-inch clay crucible, filled and covered, can be heated to full redness. The progress of the ignition can be easily examined by lifting up the chimney *g* and the dome *f* by their respective wooden handles. But the action of the furnace can also be judged of by a peculiar roaring noise which it produces. If the gas and air are mixed in due proportions, the roar is regular and continuous. If there is too much gas, the roar is lessened. If too much air, the roar is increased, but is rendered irregular and intermittent. The greater the noise, the greater the heat in the furnace, but when the roar becomes spasmodic, the flame is on the point of blowing down. To prevent that occurrence, the proportion of air must be lessened or that of gas increased.

Arrangement for Heating Platinum Crucibles as in the Fusion of Silicates with Anhydrous Carbonate of Soda.—The following arrangement is convenient when small crucibles are to be strongly heated: Anhydrous carbonate of soda in quantities exceeding 1000

Fig. 8.



grains can be thus readily fused, and small quanties of sterling silver can be melted in a clay crucible. It is also available for ignitions or fusions in small porcelain crucibles. Fig. 8 represents the arrangement of apparatus as seen in section. *a* is the gas-burner; *b*, the stool; *c*, the air-chimney; and *d*, the furnace sole, as already explained. *i* is a cylinder of fire-clay, 5 inches high, and 4 inches diameter; *k* is a plumbago or fire-clay furnace, in which is placed a small cast-iron ring, similar in form to that represented by Fig. 7, and on this ring the platinum crucible is adjusted; *l* is a fire-clay or plumbago reverberatory dome; and *g* is the chimney that forms part of the furnace represented by Fig. 5. The crucible being adjusted, the gas lighted, and the dome and chimney put on, the lapse of 12 or fifteen minutes, according to the quality and pressure of the gas, suffices for the fusion of 1,000 grains of carbonate of soda in a platinum crucible.*

It will be noticed in Fig. 8 that the crucible is placed very high above the orifice of the tube *a*, at which the gas is inflamed. The distance is, in fact, about 10 inches, the point of maximum heat in the flame being at nearly that distance from the burner, more or less according to the pressure and quality of the gas. The gas which rises from the burner *a*, though mixed with as much air as it will bear without becoming explosive when lighted, does not contain sufficient oxygen to burn all the carbon present in it. The flame produced is, consequently, quite superficial. The gaseous mixture only burns on the surface where it is in contact with fresh atmospheric air, and it requires time to take up the requisite amount of oxygen. The draught produced by the joint action of the two chimneys *c* and *g* carries the flame rapidly to a great height before the point of complete combustion is attained.

When the highest degree of heat is not required, the reverberatory dome *l* may be omitted. It must also be dispensed with when the crucible that is to be heated is of comparatively large size, because it is then liable to lower the temperature of the furnace by impeding the draught.

The effects that have been ascribed to the various arrangements of this gas-furnace can be produced with gas supplied by a pipe of a ¼-inch bore, and at a moderate pressure, giving from 30 to 40 cubic feet per hour.

The principles of heating by gas, which have led to the construction of this furnace, may be summed up as follows: When a crucible or other solid body is to be heated, it is to be wrapped in a single flame at the point of maximum heat, and loss of heat by radiation and conduction is to be prevented by the interposition of non-conducting materials (plumbago or fire-clay); and when liquids are to be boiled or evaporated, particularly when they are contained in vessels of glass or porcelain, the flame is to be broken up into numerous horizontal jets, and these are to be made to supply a large and regular current of highly heated air, by which alone, and not by the direct application of the flame, the vessel that contains the liquid is to be heated. In both cases provision must be made to secure a sufficient draught of air through the furnace, because every cubic foot of gas requires for combustion 10 or 12 feet of cubic air, and the gases which have done their duty must be rapidly carried away from the focus of heat. If the steam, the carbonic acid gas, and the free nitrogen, which constitute the used up gases, are not promptly expelled, fresh gaseous mixture, in the act of producing additional heat by combustion, cannot get near the object that is to be heated, and the heat so produced out of place is wasted.—*Chemical News.*

* If this quantity of fused carbonate of soda is permitted to cool and consolidate in a platinum crucible, the salt is liable to expand and burst the crucible.

ON GAS-LIGHTING.—COMPARISON OF COAL-GAS WITH OTHER MEANS OF ARTIFICIAL LIGHTING.—DISCUSSION ON PUBLIC LIGHTING AND RECENT IMPROVEMENS THEREIN.

By Samuel Hughes, *Civil Engineer, F.G.S.*

The artificial light produced by coal-gas, although its introduction only dates about half a century ago, has become almost as much a necessary of civilized life as either fire or water.

The increase of gas consumption far outstrips the increase of population, for while the latter scarcely any where in England doubles itself in thirty years, there are many instances of towns in which the consumption of gas has doubled in ten years.

Nor is this to be wondered at, when we consider its vast superiority in point of convenience, cheapness, and efficiency to every other kind of light. The consumer of the common coal-gas in London procures as much light from gas costing £1 as he could procure from tallow, oil, wax, or spermaceti,* by an outlay varying from £5 to £20, according as he uses the cheapest or dearest of these materials. In Lancashire or Scotland, owing to the very much higher illuminating power of the gas, he procures as much light as from London gas for one-half, or even less than half the money. These facts, with reference to the economy of gas, are now tolerably well understood.

* Experiments with the photometer, when the sperm candle is used to measure the light of gas, have taught us the curious fact that all coal-gas gives more light than an equal weight of sperm. Thus 5 ft. of common coal-gas, with a specific gravity of .42, gives a light equal to twelve sperm candles, each burning 120 gruins an hour. Now, gas of this specific gravity weighs 225 grains per cubic foot, so that 5 cubic feet will weigh 1,125; grains; but this gives a light equal to 12 sperm candles, each burning 120 grains an hour, in all 1,440 grains. In the same way it will be found that 1,475 grains of Lancashire gas, with an illuminating power of 20 candles, and a specific gravity of .53, gives as much light as 2,400 grains of sperm. This difference is due partly to the wick, which is a necessary evil in the candle, and somewhat interferes with the light; partly to the structure of the candle itself, which impedes the upward flow of air to unite with the flame; but still more probably to the carbon and hydrogen being contained in the candle in proportions not so well adapted for combustion as those which obtain in coal-gas.

Owing to improved fittings and improved modes of purification, gas now finds its way into the most elegant apartments of the best houses; and one may hope in a few years to see it as commonly used even in the bed-rooms of houses, as it is already in Scotland, where, from the first, the fittings have always been of a very superior description.

Application of Gas to Public Lighting.

The history of this is somewhat curious. When gas first began to be used for public lighting, the local authorities and their astute advisers in the legal profession were in the habit of stipulating that the new light produced from gas should be equal to the old oil lamps, which it was intended to supersede. This was a condition by no means difficult; and this continued for some years to be the only condition as to quantity of light which was insisted on so far as the public were concerned. In those early days it was considered so difficult and mysterious an affair to light and extinguish the public lamps, that local authorities were glad to entrust this to the gas companies, who therefore generally undertook not only to supply the gas for the public lamps, but undertook to light and extinguish the gas, as well as to clean and repair the lamps and posts.

Our far-seeing countrymen north of the Tweed, however, were not so simple as to entrust the lighting and extinguishing of their public lamps to the gas company; and accordingly we find that nearly all over Scotland the local authorities have kept this power in their own hands, and have merely contracted with the gas companies to pay for so much gas supplied to public lamps. A similar practice prevails in many of the Lancashire towns, and in a few of those in Yorkshire.

We shall have more to say on the extreme absurdity of the practice still followed in most parts of England—that of allowing the gas companies to light and extinguish—when we come to treat this branch of the subject in detail. In the meantime let us consider the progress or application of gas to the purpose of street lighting.

In the first place, then, the gas companies were only too glad to obtain the power of breaking up the streets at any cost, and were quite ready to enter into contracts for the supply of gas to the public lamps at almost any price. The extreme sacrifices which they were willing, and indeed compelled to make, may be inferred from the fact that, when the price of gas to the private consumer was 15s. per 1,000 feet, the public lamps were actually supplied with gas at a price per lamp per annum no higher than at present, when the price to the private consumer is only 4s.

The original burners were probably not so large as at present, for instead of being batswings, consuming five feet an hour, they were probably cockspurs, or similar burners, consuming not more than three feet. Still, even at this rate of burning, the public lamps must have consumed between sunset and sunrise about 13,000 feet of gas, so that, after deducting the expense of lighting, cleaning, &c., the gas alone must have been supplied for about 6s. per 1,000 feet, while, at the same time, the private consumer was charged 15s.

Considering the circumstances of gas-works forty years ago, it is probable that 6s. per 1,000 feet was a totally unremunerative price; and yet companies were then perfectly willing to undertake contracts for public lighting on those terms.

I have no wish to justify for a moment a price for public lighting so low as two-fifths of the ordinary price paid by the private consumer, although I do maintain that the local authority is entitled to a considerable reduction, say, for instance, something like 25 per cent. below the price charged to private consumers.

I think the local authority is entitled to this reduction in consequence of the largeness of the consumption, the certainty of payment, the saving of expense attending the collection of small amounts, the nature of the supply to which ratepayers of all classes contribute—poor as well as rich—and finally and principally, in return for the liberty of breaking up the public streets, and as some small compensation for the serious mischief and expense which this occasions. I think, when all these circumstances are taken into consideration, it is not too much to ask that a large consumer like the local or municipal authority of a town should be allowed a discount of 25 per cent., a discount which is often exceeded at the present day in many places where there are large consumers, to whom it is thought desirable to allow a differential scale of charges.

ARRANGEMENTS UNDER WHICH THE PUBLIC LIGHTING IS CONDUCTED.

There is considerable variety in these arrangements, which we shall now consider in detail:

1. When the public lamps are supplied with gas, lighted, extinguished, and repaired by the company for a fixed price per lamp per annum.

This is the arrangement which generally prevails in the metropolis and throughout the greater part of England, excluding, however, the manufacturing districts of Yorkshire and Lancashire, where it is usual to pay a price per 1,000 feet of gas or per 1,000 hours of burning.

This general arrangement may be further classified under the following subdivisions:

a. When the lamps belong to the company.

b. When the lamps belong to the local authority.

When the lamps belong to the gas company, the price is usually made up of the following items:

1. The estimated quantity of gas consumed per annum, derived from the hours of burning multiplied by the assumed consumption per hour, and calculated at a price per 1,000 feet somewhat less than the lowest price paid by any private consumer.

2. The expense of lighting and extinguishing the gas, cleaning and repairing the lamp-glasses and fittings, and painting the lamp-posts.

3. A payment for the use of the lamp and post, in the nature of a rent or annual percentage on the cost of these. Now, in estimating the cost of gas consumed by public lamps, the greatest uncertainty prevails.

Taking the case of the metropolis, in which the contracts usually stipulate that the gas company is to supply 5 ft. an hour to the public lamps, let us see what happens.

In the first place, there is no similarity or uniformity in the burners, and even if there were, it would be perfectly useless on account of the great irregularity of pressure which prevails in the mains. This pressure is usually highest at or about sunset, or just at the time when the public lamps are lighted. The pressure, at present, varies in different parts of London from 24 to 36 tenths, and most of the burners used for the public lamps would consume more than 5 ft. at the lowest of these pressures. In the winter time the pressure at sunset is kept up till about seven o'clock, when it diminishes 2 or 3 tenths. Another fall of about 4 tenths occurs at ten o'clock, a further fall of 4 tenths at eleven, another fall of 6 tenths at twelve o'clock, and between twelve and one in the morning there is another fall of 6 tenths, bringing the pressure down to about an inch or something less, and this pressure continues with little or no variation till sunrise, when the public lamps are extinguished.

These remarks apply to the Westminster district, which is lighted by the Chartered Gas Company from their station in the Horseferry road. The pressures were recorded by a very accurate self-registering pressure gauge fixed in my house, No. 14 Park street, during the last fortnight of October, 1860.

The following were the average pressures of the gas during the whole fortnight:

			Tenths of an Inch.
At 5	p. m.	the average pressure was..	30.8
5.30	"	" " ..	38.5
6	"	" " ..	33.2
7	"	" " ..	29.2
8	"	" " ..	28.3
9	"	" " ..	28.4
10	"	" " ..	24.5
11	"	" " ..	20.4
12	midnight	" " ..	14.3
1	a. m.	" " ..	8.7
2	"	" " ..	8.9
3	"	" " ..	9.1
4	"	" " ..	9.0
5	"	" " ..	9.0
6	"	" " ..	8.9
6.30	"	" " ..	9.4

308.6÷16=an average pressure throughout the night=19.29 tenths.

These pressures are considerably higher than those which prevailed during the preceding winter, and it is probable that with the taps full on the lamps at the average pressure of 19 tenths would consume the contract quantity, which, in the Westminster district, is 2½ ft. of Cannel gas, giving a light of twenty candles for 5 ft. an hour, or ten candles for 2½ ft.

But as a general rule the taps never are turned on full, nor anything like it; the lamplighter, in fact, being directed to adjust the taps so as to give the flame which he considers right according to his own judgment.

Now, as the lamplighter who has to perform this important function of regulating the public lights is an individual profoundly ignorant of pressure and its laws, and cannot for a moment be supposed capable of judging either what the pressure of the gas will be after he leaves the lamp, nor how it will affect the flame, it follows, necessarily, that this act of regulation supposed to be performed by the lamplighter, must be highly unsatisfactory and inefficient.

If we suppose him to regulate the flame so as to burn the contract quantity at the pressure with which he is dealing at sunset, it must be evident that, as the pressure falls off, the quantity consumed must be very much less than that for which he regulates the flame.

If we suppose the consumption to vary as the square root of the pressure, and assume that at sunset the taps are adjusted to burn 2½ ft. an hour, we have this proportion to find the average consumption throughout the night,

$\sqrt{30.8} : \sqrt{19.29} :: 2.5 : 1.99$ cubic feet per hour,

or 20 per cent. less than the proper quantity. It is far more correct, however, to calculate the consumption according to the $\frac{7}{10}$ root of the pressure, in which case we have—

$$\sqrt[10]{30.8^7} : \sqrt[10]{12.29^7} :: 2.5 : 1.80$$
$$11.01 : 7.95 :: 2.5 : 1.80$$

or more than 26 per cent. less than the contract quantity.

Independently of inferences which may be drawn from the diminution of pressure, however, perhaps it will be more satisfactory to refer to actual experiments which were made in public lamps on various parts of the metropolis in the year 1858.

In most of these cases the pressure at the actual burner of the street-lamp was tried at every hour throughout the night. The burner was then removed from each lamp, and the consumption, at the observed pressures, determined by an accurate experimental meter and other proper apparatus.

(To be continued.)

PATENTS.

UNITED STATES.

2,628.—F. H. Bartholomew, of New York City, for Improved Water-Closet:

I claim, first, The combination of the trap, A, hopper, B, opening, h, provided with the cap or lid, j, and the flanches, e f, either or both, at the lower part of the trap, all being arranged substantially as and for the purpose set forth.

Second, the flanch, C, for the attaching of the seat, E, directly to the hopper, B, when said hopper is attached to a trap, A, which serves the two-fold purpose of a trap and stand or support, as set forth.

Third, Constructing or casting the trap, A, in form substantially as shown and described, to wit, having it so curved that a screen or partition, d, will project forward in front of the lower or discharge end of the hopper, B, for the purpose of concealing the contents of the trap, as described.

2,639.—D. S. Hamilton, of Elmira, N. Y., for Improvement in Rotary Pumps:

I claim the combination of the annular piston space, E, having both annular sides fixed, with the butment, G, bearing on one of said fixed annular sides, substantially as and for the purpose set forth.

I also claim the combined arrangement of the butment, G, and induction and eduction apertures, J and D, so that the said aperture shall be nearly or quite radically oposite to each other, and the butment shall close diagonally between the two, and open into the eduction aperture, for the purpose specified.

I also claim inclining the closed butment and approaching piston towards each other, so that the piston shall open the butment in the direction contrary to that of its own motion, substantially as and for the purpose specified.

2,645.—August Kaestner, of New York City, for Improvement in Lamps:

I claim the combination of the tube, B, taper slot, c, large perforations, d, and horizontal ranges of small perforations, all constructed and arranged in relation to each other and to the wick tube, c, in the manner and for the purpose explained.

[The object of this invention is to obtain a lamp for burning coal-oil without a glass chimney, whereby the air is admitted to the base of the flame in such a manner as to supply the latter with a requisite degree of oxygen, and ensure proper combustion.]

2,667.—T. J. Wadleigh, of Sutton, N. H., for an Improvement in Pumps:

I claim an improved pump composed of the stock A A' A", the axle, D, the braces, I I, and corresponding braces in the rear of I I, the collar, O, the shaft, H, with its right and left screws, the wheels, O and E, the collar, M, the arms, J J, the valve rods, Q Q, the arms, K K, the supports, L L', the sliding block, R, the mortice, U, the rotary blocks, S S', with their projections, b, the collar, N, with its sliding and rotary blocks, and the lubricating cap, r, combined, arranged, and operating as above set forth.

OFFICIAL.

OFFICE OF THE MANHATTAN GAS-LIGHT COMPANY.—The Annual Election for Fifteen Directors of the Manhattan Gas-Light Co. will be held at their office in Irving Place, corner of E. 15th street, on Monday, the 13th day of January, 1862, from 9 to 10 o'clock a. m. S. H. HOWARD, Secretary.

OFFICE OF THE NEW YORK GAS-LIGHT COMPANY, 157 and 159 Hester, cor. of Elizabeth street, New York, December 26, 1861.—The annual election for Thirteen Directors of this Company will be held on Monday, the 13th day of January, 1862, from 11 to 12 o'clock a. m., at the office of the Company. The transfer book will be closed from the 30th instant until after the election.
THOMAS K. LEES, Secretary.

METROPOLITAN GAS-LIGHT COMPANY OF THE CITY OF NEW York—Office 15 Nassau street.—New York, December 28, 1861. The annual meeting of the stockholders of this Company for the election of Directors, and for the transaction of other business, will be held at the office of the Company, on Monday, Jan. 13, 1862. Polls open from 12 to 1 o'clock p. m. O. ZOLLIKOFFER, Secretary.

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CROTON AQUEDUCT DEPARTment, October 9, 1861.—Public notice is hereby given that a further penalty of ten per cent. will be added to all unpaid Water Rents, on the first day of November next.
R. C. HANCE, Register.

CITIZENS' GAS-LIGHT COMPANY OF BROOKLYN, No. 1 Post-office Building, Montague st., Brooklyn, Jan. 1, 1862.
THE BOARD OF DIRECTORS have declared a Dividend of Three per cent., payable on and after the 15th inst. Transfer books will be closed till the 15th inst.
By order of the Board,
H. WARREN, Secretary.

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S. S. ASHCRAFT, CINCINNATI, O., Manufacturer of Gas and Water-Pipes, with Branches of every description; Retorts for Gas and Oil Works; Gasholder Stands, Colums, &c.; Gas Purifiers, Condensers, and Gas Apparatus of all kinds; Foundry Work in general.

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SABBATON'S PATENT FURNACE-DOORS, & FRAMES, Floyd's Patent Malleable Iron Retort Covers, MCKENZIE'S PATENT GAS EXHAUSTERS, made by Addison Smith. Compensator-Valves, &c. Gas, Water, and Steam Tubes.

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PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-Engineers to these

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Unsurpassed by any KEROSENE manufactured. Is nearly COLORLESS, of a PLEASANT ODOR, and burns without smoke, or crusting the wick.
WARRANTED NON-EXPLOSIVE.

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Packed in cans and cases for foreign markets.
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CRUDE PETROLEUM OIL, direct from the wells in Pennsylvania—of gravity 40 and upward—at lowest market prices.

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COAL OIL! COAL OIL!! of the celebrated brand of "SILVER SPRING." A superior burning oil, white, pure, safe, and odorless.

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A LAMP CHIMNEY THAT WILL not break.—Made for the million.

The patent Mica Chimneys for coal-oil Lamps possess many advantages over the glass chimneys. They do not break from the heat, falling, cleaning, or any ordinary usage. When one is purchased it will last, with care, as long as the lamp. They fit all the burners now in use.

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These chimnies are intended for the flat flame which, heating all parts of the glass equally, does not expose it to cracking.

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FREEZING OF GAS-PIPES.—Walton's Patent Anti-Freezing Apparatus illustrated by Engravings in the AMERICAN GAS-LIGHT JOURNAL, of Jan. 1, 1861, page 212, is the most simple, durable and efficient of any known process.

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STERLING GAS-REGULATOR,
Improves the Light and Saves a Large Per Centage of Gas.

MANUFACTURED BY THE
WHEELER & WILSON SEWING MACHINE COMPANY.

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By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the
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For Protecting the Flues and Preventing Steam-Boiler Explosions.

This is a reliable High and Low Water Detector, arranged so as to render it one of the best Water Gauges ever attached to a Steam-Boiler; always presenting before the Engineer at sight the exact height of the water, and if, by oversight or by sudden leakage, the water gets low in the boiler, it will cause an alarm before the water gets below the flues, thereby preventing an explosion. This Gauge can be made to alarm at any point desired as a High Water Detector, thereby preventing the water from getting to that height as to be forced into the cylinder of the engine, often causing serious accidents. Thus it is a High as well as a Low water Detector. For sale by
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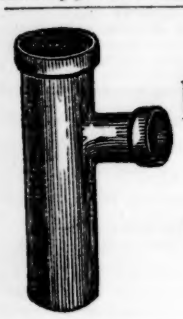
153 Centre st., corner of Canal st., New York,
Where a Gauge is constantly in operation.



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The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lap-welded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass work for Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST-IRON PIPE AND GAS-METERS.
All Goods Warranted.

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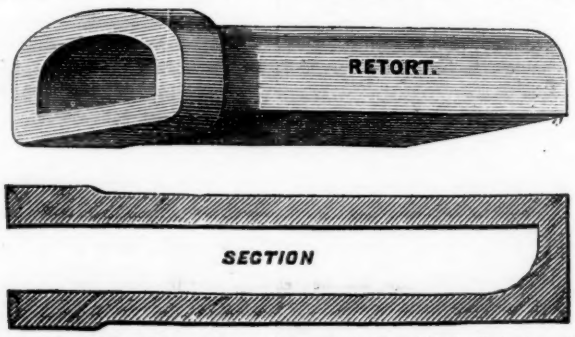

KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them

Free from Cracks and Correct in Form.

By great care in Manufacturing, combined with the advantages in Burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

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Apply to E. W. BARSTOW, 83 Maiden Lane, New York, where samples can be seen.

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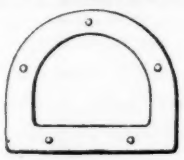
PROPRIETORS OF
Best Glass-House Pot & Crucible Clay.
Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.
AMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

COWEN'S PATENT FIRE-CLAY RETORTS.



JOSEPH COWEN & CO.,
BLAYDON BURN, near Newcastle-on-Tyne, England,

Have always been, and are still, the most extensive manufacturers of FIRE-CLAY RETORTS in the United Kingdom, and were the only parties to whom a Prize Medal was awarded at the Great Exhibition, in London, 1851, for

"GAS RETORTS, AND OTHER OBJECTS IN FIRE-CLAY."

J. C. & CO. make Fire-Clay Retorts of all shapes and dimensions, and to fit existing mouth-pieces.

Orders for FIRE-CLAY RETORTS, TILES, BEARERS, and other articles in Fire-Clay, receive immediate attention, and are promptly executed at their Works, as above. Drawings of Settings adapted for Cowen's Patent Fire-Clay Retorts supplied.

AGENTS, MESSRS. MEAD & BELL,
13 CLIFF STREET, NEW YORK.

N. B.—J. C. & CO.'S RETORTS are well adapted for small Gas-Works, as they can be used without an Exhauster.

POTTS' REVOLVING SIGNAL LIGHTS,

PATENTED SEPTEMBER 8, 1857.

Mr. ALBERT POTTS, the well known Inventor of the LAMP-POST LETTER-BOXES, which have been adopted by the Post-Office Department for the large cities of the United States—and also of the GAS METER BOX, to be set in the front walls of houses, thus doing away with visits from Gas Inspectors, or burglars in gas-clothing, has lately brought forward a third Invention, which in point of importance and world-wide usefulness, surpasses the others entirely.

These SIGNAL LIGHTS are intended for use on Vessels propelled by Steam, and those exclusively. They specially indicate the presence of a Steamer, and by their use, there will be less likelihood of mistakes, and consequent collision than at present. They are also intended for SIGNALLING AT NIGHT, and can be used for that purpose UNDER ANY CODE of SIGNALS NOW ARRANGED FOR FLAGS.

This Improvement in Lights for Steam Vessels, consists in having the Lanterns containing the colored lights, connected by means of a series of cogged gearing with some convenient part of the Engine or Machinery, so as to cause them to have a revolving motion around their axis. On side wheel steamers, the Lanterns should be placed directly over the wheel-houses, and the power, or motion to turn them, may then be very conveniently obtained from the paddle wheel shaft. On Propellers, the Lanterns should be placed on each side of the Pilot House, or hurricane deck, and the rotary motion derived from any convenient or suitable part of the Engine or Propeller Shaft. Each Lantern is supported on the end of movable cranes, so that their relative positions may be changed and properly adjusted to suit the view of observers on either side of the vessel at the time of signalling.

The Lanterns to be used in this improvement may be constructed for Burning Oils, Fluids, Gas, or any of the known modes of illumination, and should be furnished with one or more lenses and reflectors, so as to concentrate the rays of light, and project them over the horizon with the greatest intensity. The lenses for this purpose should be made with colored glass, viz., Red and Green, and the position of the respective Lanterns, according to the color of the lenses therein, must be placed on the sides of the vessel so as to answer to the requirements of Rules and Regulations made and published by the Supervising Inspectors of Steamboats, agreeably to the Act of Congress of the United States in such cases made and provided. That is to say—by said Regulation—the Lantern having the green lenses for producing the Green Colored Light, must be placed on the starboard side of the vessel, and the other Lantern producing the Red Light, to be placed on the port side thereof. In pursuance, also, of the aforesaid Rules and Regulations, there is to be found in board and behind each Lantern, a screen to answer the purposes therein mentioned.

The cogged gearing, by which the Lanterns are connected with the Engine or paddle wheel shaft, and thereby caused to revolve when the Engine is in motion, is so arranged that the connection may be readily shipped or unshipped, and the lanterns made stationary or otherwise, at the pleasure of the Pilot, or those whose duty it may be to operate and attend to the same. The cranes on which the Lanterns are placed, are also rigged so as to be readily turned horizontally from one position to another, so as to present one or both lights to the view of observers when laying athwart ships at the time of signalling.

On the Use and Application of the Improvement for Night Signals.

When the vessel is under weigh, or going ahead in its course, the Lanterns are to be placed directly athwart ships, so that such colored light therein will then have the position and place prescribed by Rule Seventh of the aforesaid Supervising Inspectors of Steam Boats, and with the screens behind them, as above described, will then answer all the intents and purposes for which the colored lights are thus required to be used, as illustrated in the several diagrams published by said Inspectors for the working of a system of Colored Lights. The Lights in this case, according to the color seen by the observer, indicate the course or direction of the vessel whereon they are carried. When the Lanterns with the colored lights therein, are made to revolve around on their axis, as proposed in this improvement, in addition to the signal above, another, and as we believe, very important and useful signal is thus formed, indicating that the vessel, whereon it is carried is a Steamer. In dark foggy nights, it is found by experience, to be somewhat of a difficult task to distinguish sailing vessels from Steamers and Propellers, especially when the latter are rigged, and carry a press of sail. When Steamers meet "head and head," it is the duty of each to pass to the right, or, on the larboard side of the other. Whereas, when a Steamer meets a sailing vessel, the former must give way and allow the latter to pursue its course. Hence, to carry out the regulations of the said Steamboat Inspectors, and prevent collisions, it is important to have some infallible sign, whereby the character of the vessel may be readily seen and determined. Several very fatal collisions have recently taken place through mistakes of this kind.

On Signals for Speed and Distance.

The gearing of the Lanterns with the paddle wheel or propeller shaft, may be so arranged as to be an index of their speed. A very good proportion, would probably be to make the Laterns turn about one-third as fast as said shaft. Hence, when the speed of the vessel is previously known, when making a certain number of revolutions of the paddle or propeller, it becomes an easy task from observing the time with which the Lanterns thereon may be turning to approximate to the speed with which the said vessel is moving at the time of observation. Again, as the arcs described by the rays of light from each lantern, as they revolve around on their axis, is greater in proportion to the distance from said lantern, so will the time in which said rays move over any given space, be less in the same proportion. Hence, when the lights are very remote, or far off, from the observer, the duration of each column or cylinder, of rays from each lense, would pass the eye of the observer, in a short space of time, or with great velocity. Whereas, at a nearer point of observation, the time of its passage would be considerably lengthened, or the motion thereof apparently much slower. From these facts, we believe the improvement is susceptible of indicating, in an approximate manner, the speed and distance of vessels whereon the revolving lights may be used.

On the Application of the Improvement for Marine Telegraphic Purposes.

The Revolving Lights can be readily applied to the general purposes of Marine Signalling at night, as follows: In order to show this application, we have adopted the Numbers as given in Roger's Code of Marine Day Signals, believing that work to be somewhat of a standard in matters of this kind. Instead of the flags used in the above code, for day signals, to indicate the combinations of two or more letters of the Alphabet, which combination is referable to certain numbers indicative of the words or sentences telegraphed, we propose to perform the same operation, at night, by means of the two revolving colored lights, so as to indicate the numbers directly to which the intended words or sentences to be telegraphed are referable. Thus, whether the vessel to be signalled is ahead, astern, or abaft the beam, the position of the two colored lights must be so adjusted, by means of the moveable cranes, whereon said lanterns or lights are fixed, that the two lights may be fully made visible to the observer. When both lights are thrown into this position, stopping the motion of the lanterns may be the signal for calling attention, or a rocket fired off, or the steam whistle blown, would answer the same purpose. Now, in order to represent the ten numerals, we propose to indicate them by the respective motions of the two colored lights, as follows:

RED LIGHT.				GREEN LIGHT.			
One Red,	Represents	Number	1.	Two Green,	Represents	Number	2.
Three do.	do.	do.	3.	Four do.	do.	do.	4.
Five do.	do.	do.	5.	Six do.	do	do.	6.
Seven do.	do.	do.	7.	Eight do.	do.	do.	8.
Nine do.	do.	do.	9.	One do.	do.	do.	0.

In the above arrangement, it will be seen that all the odd numbers are made by the Red Light, and the even numbers by the Green Light. In order to indicate the repeat of the last number, once or more times, or for other special purposes, which may hereafter be found useful and necessary, an even number of lights may be shown by the Red, and an odd number by the Green. It will be understood that when the Lanterns are made with three lenses in them, the numerals as above arranged are formed by the number of times a new light or lense is presented to the observer. Thus to indicate the number 3, the Red Light or Lantern would make one entire revolution; and to make the number 6, the Lantern carrying the Green Light would make two revolutions, and so on with the other numbers. When a symbol is made, the motion of the Lantern is to be suspended for a short time, and when a number expressing a sentence is formed, the lantern may be stopped for a longer period, or some one of the special signals above referred to, may be used for this purpose.

To show the application of this improvement as above mentioned, whereby these Lights can be used as readily for Night Signals, as Flags are used for Day Signals by the author of Roger's Code, we shall use the sign O, colored red or green, according to the light used, to show the number of movements performed by the respective lights in order to represent any desired number of said code, suitable for the required purpose.

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O,	
O, O, O, O, O, O, O.	
	O, O.
	O. O.

The above would represent the number 5722, and by reference to said Roger's Code, would be found to stand before the sentence:

"WILL YOU SHOW THE NUMBER THAT REPRESENTS YOUR NAME?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O.	
O, O, O, O, O, O, O.	
	O, O.

Here the number expressed is 1572, and per the same Code, stands for

"WHERE ARE YOU BOUND?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O, O, O, O, O.	
	O, O, O, O, O, O, O, O.

The number thus expressed is 1928, and per said Code is

"WHAT IS YOUR CARGO?"

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O.	
	O, O, O, O, O, O.
	O.
O, O, O.	

Here the number expressed is 5603, and stands for

"HAVE YOU ANY NEWS?"

(RED LIGHT.)

Fig. 2

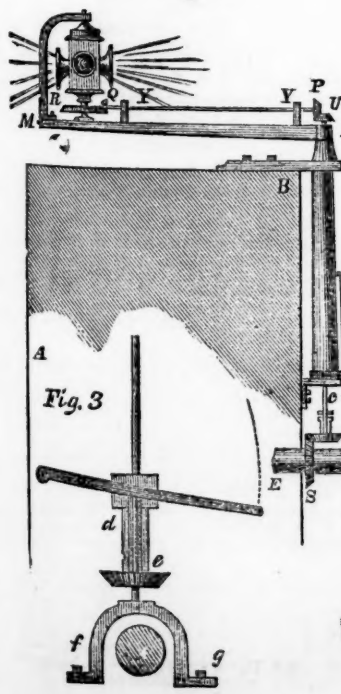


Fig. 3

(GREEN LIGHT)

Fig. 1

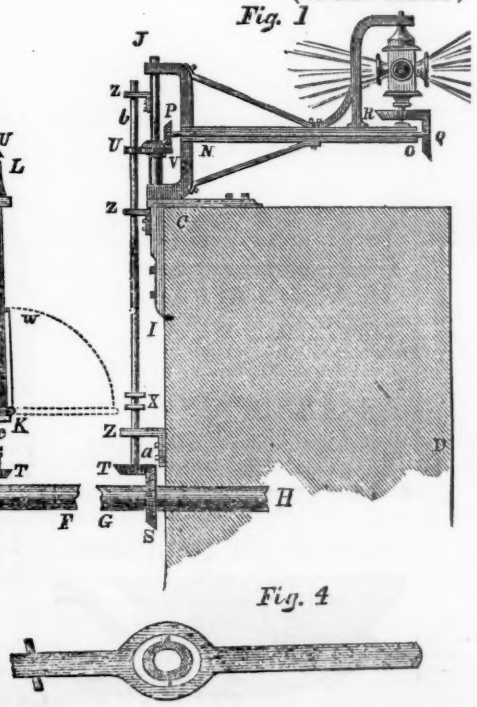


Fig. 4

MECHANICAL CONSTRUCTION.

In our engravings, Figs. 1 and 2, represent Vertical Sections through the wheel-house. In them E F and G H represent portions of the main Shaft. In Fig. 1, I J is a stout Iron or Wooden post, fastened against the side of the wheel-house, directly over the main shaft On the upper part of this post, is fitted the moveable arm or crane N O, to the main shaft is fitted the bevel wheel S, and to the lower end of the rod a b, is fitted a corresponding wheel T. U is a small pinion on a b, which gears with the spur wheel, V, which in turns gives motion to the wheels, P and Q, and so revolves the lamp R. It will be seen that a Rotary motion is given to the lamp, when the main shaft is in motion and a b connected.

It can be disconnected by a lever, acting between the bosses X, which will elevate the rod in the guides Z Z Z.

Fig. 2 is another arrangement, for the same purpose. In this, K L, represent a hollow Shaft, on which is firmly fastened, the arm L M, on which is the lantern. The hollow post is secured to the wheel-house by the straps K and B, and it can turn freely in them, the other part being the same in them as in fig. 1

The lever K W, when drawn down, will turn the frame in any required position around the Shaft c U. In fig. 1, the arm or crane N O, may be operated by cords from the wheel-house, but in this device, the rod c U, does not lift up as in fig. 1, but in its place, the lower end is made square, and on it slides the short tube, d E, shown in fig. 3. The lower end of the rod turns on a bridge, f g, spanning the main shaft. On the upper end of the tube, d e, a lever is attached by means of boxes and collars as shown in fig. 4. This lever when raised carries with it the beveled wheel T, thus disconnecting the gearing apparatus.

ALBERT POTTS, Patentee,
PHILADELPHIA, Pa.

PROPOSALS.

TREASURY DEPARTMENT,

OFFICE LIGHTHOUSE BOARD, Dec. 6, 1861.

Sealed Proposals will be received at this office until one o'clock P. M. on Monday, the 6th day of January, 1862, for supplying the Lighthouse establishment with seventy thousand gallons of the best quality pure winter strained sperm oil, to be divided into three lots, and to be delivered at the times undermentioned, alongside of the government supply vessels, or at the warehouse or other places of deposit, to be designated by the inspecting officer or other authorized agent of the Lighthouse Board, in strong, tight, well made casks, suitable for shipping, in good order, of an average capacity, each, of from eighty to one hundred gallons.

Either lot or all of them may be delivered at New York, New London, Sag Harbor, Boston, New Bedford, Edgartown or Nantucket, at the option of the bidders. The place of delivery must be distinctly stated in the bids, and will be embraced in the contracts.

The three lots will be delivered as follows, viz:

Lot No. 1.—(23,000) Twenty-three thousand gallons on the 1st day of April, 1862, or as soon thereafter as the proper tests and gauging can be completed.

Lot No. 2.—(32,000) Thirty-two thousand gallons on the 1st day of June, 1862, or as soon thereafter as the proper tests and gauging can be completed.

Lot No. 3.—(15,000) Fifteen thousand gallons on the 1st day of October, 1862, or as soon thereafter as the proper tests and gauging can be completed.

No part of the oil proposed for and to be embraced in the contracts under this advertisement will be accepted, received, or paid for, until it shall have been proved to the entire satisfaction of the person or persons charged with its examination, test and inspection, to be the best quality pure winter strained or bagged sperm oil, free from mixture with other or inferior oils and adulterations, and that it will remain in a sufficiently fluid state for free burning in lamps at a temperature of 32 degrees or lower of Fahrenheit's standard thermometer.

The usual means for determining the character and quality of the oil will be employed, viz.: for specific gravity, by burning to determine the length of time the oil will burn in untrimmed capillary or jacket lamps, the amount of residuum in each lamp after it burns out, and, if necessary, any other proper tests to arrive at correct conclusions that may be deemed necessary.

The casks must be gauged, under the direction and personal supervision of the inspecting officer, by a custom-house or other legally authorized and sworn gauger, according to the United States standard, and must be marked and accepted before they are removed from the cellar or warehouse of the contractor.

Proposals will be received and considered for each lot separately, or for all of them, at the option of the bidder; but no bid will be considered for a less quantity than that specified as one lot, to be delivered at one time and place. Each bid must state explicitly the rate per gallon, in writing, the number of lot or lots bid for, and the time and place of delivery, conforming to this advertisement.

Bids submitted by different members of the same firm or copartnership will not be considered.

The Lighthouse Board, under the authority of the Department, reserve the right to reject any bid, although it may be the lowest, for other considerations than the price.

No bid will be considered for any other kind or description of oil than that specifically called for in this advertisement.

A bond, with security to the satisfaction of the Department, in a penalty equal to one-fifth of the amount of each contract made under these proposals, will be required of each contractor, conditioned for the faithful performance of the contract, to be executed within ten days after the acceptance of the bid.

Every offer must be accompanied by a written guarantee, signed by one or more responsible persons, and known to the Department as such, or certified by a United States District Judge, Attorney, Navy Agent, or Collector of the Customs, to the effect that, if the bid or bids be accepted, the bidde r or bidders will duly execute a contract in good faith, according to the provisions and terms of this advertisement, within ten days after acceptance; and that in case the said party or parties offering shall fail to enter into the contract as aforesaid, he or they guarantee to make good the difference between the offer of the said party or parties and the next lowest bidder. All bids must be sealed and endorsed "Proposals for oil for lighthouses," and then placed in another envelope, and directed, prepaid, to the Secretary of the Lighthouse Board, Washington city.

All bids will be opened publicly, at the hour and on the day specified.

Payments will be made for the several lots of oil within thirty days after they have been received by the United States.

By order of the Lighthouse Board,
THORNTON A. JENKINS, Secretary.

FORM OF OFFER.

I (or we), ——, of ——, State of ——, hereby offer and agree to furnish and deliver at ——, agreeably to the provisions, and in conformity to the terms, of the advertisement of the ——, from the office of the Lighthouse Board. Should —— offer or bid be accepted, —— request to be informed at ——, and that the contract may be forwarded to —— for signature and certificate.

—— —— (Signature.)

(Place.) ——.
(Date.) ——.

FORM OF GUARANTEE.

We, the undersigned, residents of ——, in the State of ——, hereby jointly and severally covenant with the United States, and guarantee that in case the foregoing —— ——, of ——, be accepted, —— will, within ten days after the acceptance of said ——, execute a contract for the same, with good and sufficient sureties, to deliver the —— of oil proposed, in conformity to the terms of the advertisement hereto appended, under which it was made. And in case the said —— shall fail to enter into a contract as aforesaid, we guarantee to make good the difference between the offer of the said —— and the next lowest bidder.

Witness: ——.

—— ——. } Sureties.
—— ——. }

(Place.) ——.
(Date.) ——.

I hereby certify, that to the best of my knowledge and belief, the above named guarantors are good and sufficient.

—— ——. (Signature.)

(Place.) ——.
(Date.) ——.

PORTABLE GAS-WORKS.

STRATTON & BROTHER'S PATENT GAS-WORKS, for making Gas from ROSIN or COAL OILS. STRATTON'S Patent Double Retort, for Coal, Wood, or Rosin.

Our Patent Gas Works have been put up in some forty Country Residences, Factories, Churches, &c., in which an experience of *ten years* gives entire satisfaction.

Water Works also put up in country residences. All work warranted.

Reference—Prof. JAS. C. BOOTH, U.S. Mint, Phila.
CORNELIUS & BAKER, "
STRATTON & BROTHER,
719 Walnut street, Philadelphia.

BUTLER'S PATENT PORTABLE **ROSIN GAS-WORKS,**
FOR
Dwellings, Churches, Country Villages,
As well as for Consumers in Large Cities.
JOHN BUTLER,
No. 112 Fulton st. and 15 Henry st.,
Brooklyn, N. Y.

FOR LIGHTING RAILROAD CARS AND STEAMBOATS
☞ WITH GAS.
The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.
Apply to the
NEW YORK CAR & STEAMBOAT GAS. CO.,
No. 117 Fulton st., N. Y.

C. R. WOODWORTH, Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET, NEW YORK CITY.

WATER-METERS.

H. R. WORTHINGTON'S PATENT Water-Meter.—This Meter combines accuracy, simplicity and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

STOP-COCKS, &C.,

DANIEL THOMPSON, Machinist and Manufacturer of Stop-Cocks, Fire-Plugs, &c., for Water-Works, Stop-Cocks, Valves, Drip Pumps, &c. for Gas-Works, No. 133 Elfreth Alley, Philadelphia.

IRON RETORTS.

CELLULAR GAS-RETORTS.—C. M. CRESSON'S CELLULAR Gas Retorts, Patented October 3d, 1854. Adapted to the manufacture of GAS from Rosin, Coal, Wood, &c., and now in use at the Philadelphia Gas Works. Patent Rights for sale. For information apply to HENRY S. HAGERT, Attorney for Patentee, S. E. cor. of Walnut and Sixth sts., Philadelphia, Pa.

NEWSPAPER WRAPPERS. Mara's Patent Self Sealing and Folding Water-lined Newspaper Wrappers, $1.50 per 1000. Sold by all Booksellers and News Agents throughout the United States and Canada.
L. P. MARA, STATIONER,
418 Eighth Avenue, near 32d st.,
New York City.

HARRIS LOUDERBACK, FIRE-BRICK LAYER
AND GAS RETORT SETTER,
No. 1005 Clement Street, Philadelphia.

Niagara Falls Water Power.

CAPITALISTS AND MANUFACTURERS.—This immense water-power is now ready for immediate occupation, together with one hundred acres of land, embracing one-quarter of the village, on which to locate mills and manufactories.

The stipulations for price of power will be one-half that at Lowell, Mass., and the quantity is almost unlimited.

Should the demand warrant it, the American Fall can easily be be stopped and its great volume discharged through the bank below its present site, for mill purposes, under a head and fall of 200 feet.

The title is perfect and the estate unincumbered. For further information apply to N. W. Day or A. P. Floyd, Niagara Falls; Alexander Hay, No. 1208 Vine st., Philadelphia; Hon. T. A. Jenckes, Providence, R. I.; D. Thaxter, Boston, or the owner,

HORACE H. DAY, No. 91 Liberty st., N. Y.

GAS AND WATER-PIPE.

W. & J. GRIFFITHS & CO.—City Tube Works, Malleable Iron and Brass Foundry, No. 27 North Seventh street, Philadelphia. Manufacturers of Wrought Iron Pipe, Lap-Welded Flues and Fittings; also, Brass Work of all descriptions, for Gas, Steam and Water. Particular attention given to Heating Buildings, &c.

PARIS'S PATENT
Glass-Enamelled Wrought Iron Tubes,
PROSSER'S PATENT
LAP-WELDED IRON BOILER TUBES.
TUBES FOR ARTESIAN WELLS, CONVEYING STEAM OR WATER, SHAFTING, &c., SCREWED OR COUPLED TOGETHER, in various ways.
THOS. PROSSER & SON, 28 Platt st., N.Y.

CAST AND WROUGHT IRON Pipe, Branches, Elbows, Sleeves, &c. Lamp-Posts, Wrought-Iron Lanterns for Lamp-Posts, Gas Retorts (clay or iron), Street Mains in 9 or 12 feet lengths. Sheet-Iron cut to pattern for Gas-holders. For sale by the Manufacturers' Agent,
HENRY G. NICHOLS, 24 Pine st., N. Y.

HUNTER, KELLER & CO., Manufacturers of
WROUGHT-IRON PIPES & FIXTURES,
of all descriptions, for
STEAM, WATER AND GAS.
144 Centre street, New York.

GIRARD TUBE WORKS—MURPHY & ALLISON, Proprietors. Wrought Iron Coke-Welded Tubes, for Gas, Water, Steam, &c. Wrought, Cast and Malleable Iron Fittings, Steam and Gas Cocks, Valves. Also, Galvanized Tubes and Fittings.
Office 1908 Market street, Philadelphia.

AMERICAN TUBE WORKS.—W. G. Smith & Co., Forty-sixth street, East of 10th Avenue, New York City. Manufacturers of WELDED IRON PIPE for Steam or Gas, of all sizes, from 1-8th to 3 inches.

PATENT PREPARED WOOD-PIPE for Gas Mains.—Wm. Stephenson would call the attention of Gas Companies and Engineers to his Patent Prepared Wood Gas-Pipe. This Pipe is prepared in a way so as to effectually prevent its decay, and has been proven to be superior to Iron pipe in three towns where he has erected Gas-Works.

The cost of the Pipe, and the facility with which it can be laid, and *also its not being subject to expansion* and contraction by change of temperature, render it *entirely free from leakage;* there is also less condensation than in Iron pipe. These are among the advantages gained by the use of this Pipe, and are sufficient to recommend it to the favorable consideration of Gas Companies and Engineers; and it is considered, by those who have examined it, as a most valuable improvement.

A sample of this pipe may be seen at the rooms of the AMERICAN GAS-LIGHT JOURNAL, No. 39 Nassau street, New York; and further information, with reference to this Pipe, may be obtained by application to the Patentee,

WM. STEPHENSON, Gas Engineer,
Fremont, Ohio.

PATENT BITUMENIZED PIPES for Water, Gas, and Drainage.—Reduction in price on account of the exemption from duty on paper. These pipes possess all the properties necessary for the conveyance of Gas, Water, and also for Drainage purposes, viz., great strength, great durability, and perfect inoxidability; and being non-conductors are not affected by frost, like metal pipes; they are proved to resist a pressure of 220 lbs. on the square inch (equal to 500-ft. head of water), and can be made up to any greater strength if required. They are only one-fourth the weight, and when laid down are fifty per cent. cheaper than iron pipes; they are made in 7 ft. lengths, and the joinings are simple and inexpensive.

These Pipes have been in use nearly three years, and have given the most perfect satisfaction.

Further particulars as to joining, &c., and specimen pipes, may be obtained at the office of the Company, on application to

Mr. ALEXANDER YOUNG,
14 Cannon street, E. C.,
London, England.

☞ An agent will soon be appointed for New York.

HEATING APPARATUS.

JOSEPH NASON & CO., Constructors of Apparatus for Warming Public and Private Buildings by Steam and Hot Water.

Improved Fans for Ventilating Hospitals and other Public Buildings.

JOSEPH NASON,
HENRY R. WORTHINGTON,
No. 61 Beekman street, corner of Gold street, New York.

McKINNY & KELLY,
MANUFACTURERS OF
COAL-SCOOPS AND COKE-BARROWS,

FURMAN ST., near Fulton Ferry, Brooklyn, N.Y.

GAS-BURNERS.

T. G. ARNOLD, Manufacturer of Gas Burners, Mercury Cups, Portable Sockets, Burner Pillars, &c., No. 447 Broome street (second door west of Broadway), New York. Imported Scotch Tips and Burner Plyers always on hand.

ORNE'S PATENT FILTER-REGULATING GAS-BURNER, admitted by all practical and scientific men, who have examined its movements, to be
THE BEST GAS-BURNER YET INVENTED.
They are self-regulating, gas-purifying, indestructible, and most economical.
For sale by S. A. STETSON & CO.,
350 Washington st., Boston.

PERFECTION.—This recent Improvement in Gas-Burners embraces the great economy of the Hicks Patent Burner, a gain of over 75 per cent. in light. This Burner is now offered to the Trade and all consumers of gas, at the price of the common burner. It is anti-corrosive, gives a uniform and beautifully-shaped blaze, under any pressure, and will not get out of order.

It has been adopted by the Manhattan and Brooklyn, N. Y., Gas-Light Cos., for street lamps.

Samples will be sent to each Gas Co. in the United States, if requested.
Address, L. E. HICKS, 335 Broadway, New York.

WOODEN PURIFYING TRAYS.

WOODEN TRAYS FOR GAS-PURIFIERS.—The subscriber manufactures the WOODEN TRAYS for GAS-PURIFIERS on the invention of Wm. Combe, *cut from solid wood*, which are found superior to the iron plates formerly used, as being cheaper and more durable. The public are cautioned against the statements of R. G. Hunt, published in the AMERICAN GAS-LIGHT JOURNAL, Nov. 1st, 1861, page 137, as wholly without foundation. The following letter is from the Commissioner of Patents:

U. S. PATENT OFFICE, Nov. 9th, 1861.

Sir,—I have to inform you that *no patent has been ordered to issue* to Mr. R. G. Hunt on his application [for solid wood trays or gas sieves] with which an interference was declared with the application of Mr. Hawxhurst, assignee of Wm. Combe. Respectfully,
D. P. HOLLOWAY,
Com. of Patents.

All orders for Solid Wood Trays executed at the shortest notice on reasonable terms by
JOHN L. CHEESMAN,
No. 147 Avenue C, near Tenth st., New York City.

CONICALLY SLOTTED SOLID Wood Trays for Gas-Purifiers.—Admitted to be the best, cheapest, and most durable seives for gas-purifiers ever used.

Secured by Letters Patent of the United States, both for the machinery used in the manufacture, and for the seive itself.

For sale on reasonable terms to Gas-Light Companies or Agents, on application, by letter, to the patentee,

RICHARD G. HUNT,
631 Fourth st., near Avenue C,
New York City.

N. B.—All persons are warned against purchasing these seives of others who falsely pretend to have patents for them. Suits will be commenced immediately against all persons infringing my patents by using or making wooden sieves, but those who hereafter purchase from me can buy their seives cheap and will not be troubled by me on account of former purchases. R. G. H.

GAS-ENGINEERS.

SCAMMON'S GAS-APPARATUS for Private Residences, Factories, Hotels and Cities. See engravings of Rosin and Coal Gas-Works in AMERICAN GAS-LIGHT JOURNAL for Dec. 1, 1860, pages 179 and 180.
STEPHEN SCAMMON,
GAS-ENGINEER AND CONTRACTOR.
561 Broadway, New York.

GAS-WORKS ERECTED FOR Cities and Villages. Plans and Specifications furnished for works of any desired capacity, drawings of Retort Settings for Benches of one, two, three or five Retorts.
GAS APPARATUS
of every description.
F. A. SABBATON,
Gas-Engineer and Contractor, Albany, N. Y.

DIMMOCK, DWIGHT & CO. Engineers and Contractors for the erection of Coal Gas-Works. Offices 135 and 137 William street, New York City; and No. 2 Elm street, Springfield, Mass.

References by permission:
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AARON CLAFLIN, Esq., "
A. B. WOOD, "
GEORGE BLISS, Esq., N.Y., Pres. M.S & N.I.R.R.Co.
GEO. M. ATWATER, Esq., Springfield, Mass.
JAS. D. BREWER, Esq., Pres. Springfield Gas Co
JOHN I. BAKER, Esq., Pres. Beverly Gas Co.
HENRY E. RUSSELL, Esq., Pres. N. Britain Gas Co.
J. DUNHAM, Esq., Pres. Norwich, Ct. Gas Co.
W. C. STREET, Esq., Sec. Norwalk, Ct. Gas Co.

THE AUBIN GAS-WORKS CO., OF ALBANY, N. Y., refer to the following Gas-Light Companies using their Works, to prove that Gas stocks can pay handsomely, and yet a rich and *cheap* Gas be made, viz.: Plattsburgh, Whitehall, Palmyra, Waterford, Bath, Amsterdam, Fort Plain, N. Y.; Rutland, Vt.; Flemington, N. J.; Smyrna and Dover, Del.; Jersey Shore and Pittston, Penn.; Greensboro and Salem, N. C.; Sorel, St. Hyacinthe, and Point Levi, Canada. Agents wanted to extend the sale of the Aubin Portable Gas-Works, unsurpassed for simplicity, safety and economy.